

Bid Specification

Washington City Grapevine Substation Relay Panels

October 2024



**Intermountain Consumer
Professional Engineers, Inc.
1145 East South Union Avenue
Midvale, Utah 84047
(801) 255-1111**

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NOTICE TO BIDDERS

NOTICE TO BIDDERS:

Bids will be received by Washington City ("Purchaser") for:

**WASHINGTON CITY
GRAPEVINE SUBSTATION
RELAY PANELS**

The Bids will be for the furnishing of three (3) Relay Panels for the Grapevine Substation. Bids will be in accordance with the Specification Documents prepared by Intermountain Consumer Professional Engineers, Inc. ("ICPE"), (hereinafter referred to as "Engineer").

Proposals are to be emailed to **Tara Pentz** (tpentz@washingtoncity.org) at Washington City (hereinafter referred to as "Purchaser"), before 3:00 pm on November 21, 2024. The purchaser shall enter into only one contract for the equipment to be provided under this specification.

The project schedule is as follows:

Bid due date: ***November 21, 2024***

Equipment delivered to the project site on or before: June 10, 2025. Please provide an alternative bid if this delivery cannot be met.

Purchaser reserves the right to reject any or all bids or to waive any formality or technicality in any bid in the interest of Purchaser.

INSTRUCTIONS TO BIDDERS

1. SECURING AND COMPLIANCE WITH BID DOCUMENTS:

- A. Bid Documents (comprised of a Notice Inviting Bids, Information for Bidders, General Requirements and Bid Forms) for the equipment described in the Notice to Bidders will be on file at the office of Intermountain Consumer Professional Engineers, Inc., (“Engineer”) 1145 East South Union Avenue, Midvale, UT 84047, where they may be consulted or secured for the purpose of bidding.
- B. Bidders shall comply with all conditions stipulated in the Bid Documents.

2. INTERPRETATION OF DOCUMENTS:

- A. If any Bidder has questions as to the meaning of any part of the Bid Documents, or finds errors, discrepancies or omissions in the documents, the Bidder shall immediately request an interpretation or correction of the documents by the Engineer.
- B. The Engineer will promptly clarify the part of the document in question and issue written instructions/clarifications to all prospective Bidders. Verbal instructions/clarifications shall not be valid, regardless of source.
- C. Requests for clarifications must be received by the Engineer a minimum of four (4) working days prior to the bid receipt date.

3. PREPARING AND SUBMITTING BIDS:

- A. The Bid Forms included elsewhere in the Bid Documents shall be completed by the Bidder and shall be included as a part of the Bidder’s bid.
- B. Bid forms shall not include marks, erasures, or writing changes, other than those provided or requested.
- C. No verbal or telephone bid modifications or cancellations will be considered.
- D. The Bidder’s bid shall remain valid for a period of sixty 60 days after the bid receipt date.
- E. Bids shall be signed by an officer duly authorized to sign bid documents and obligate the Bidder.
- F. Bids shall reflect the cost of all work required by the bidding documents, including additions, deletions or modifications required by addenda issued prior to the bid opening.
- G. Bids shall be submitted by email and addressed to:

Tara Pentz, Recorder
Washington City
111 North 100 East
Washington City, UT 84780
Email: tpentz@washingtoncity.org

All bids shall be clearly marked:

“Bid Proposal – Washington City – Grapevine Substation – Relay Panels”.

- H. It is Bidder's responsibility to ensure that his/her bid is received at the proper time and place. Any bid received after bid receipt time will be considered non-responsive.

4. CORRESPONDENCE:

- A. All bids shall be addressed to:

Tara Pentz, Recorder
Washington City, Utah
111 North 100 East
Washington City, UT 84780
Email: tpentz@washingtoncity.org

(e-mail bids are not accepted)

- B. Technical questions and requests for clarification, and submissions of drawings/information shall be addressed to:

Mr. Mac Fillingim, P.E.
Project Engineer
Intermountain Consumer Professional Engineers, Inc.
1145 East South Union Avenue
Midvale, UT 84047
Telephone: (801) 255-1111
Email: mac.fillingim@icpeinc.com

5. BID WITHDRAWAL

Prior to the specified time for receipt of bids, Bidders may withdraw a bid by written request.

6. BID RECEIPT TIME

The time for receipt of bids (bid receipt time) is as stated in the Notice to Bidders.

7. AWARD OR REJECTION OF BIDS

The Purchaser reserves the right to reject, without cause, any and all bids received and to waive any irregularities therein. It should be noted that alternative bids will be accepted or rejected, as determined to be in the best interest of the Purchaser.

8. ACCEPTANCE OF BID

No Bidder shall consider state or imply that he/she has been selected to provide the equipment described in the Notice Inviting Bids until a signed Notice of Award and a Purchase Order have been received from the Purchaser by the successful Bidder.

PART 1 - BID FORMS

Bidder: _____ Date: _____

TO:

TO: Tara Pentz, Recorder
Washington City
111 North 100 East
Washington City, UT 84780
tpentz@washingtongcity.org

Gentlemen:

The undersigned, in compliance with Instructions to Bidders, having examined the specifications and related documents and being familiar with all of the conditions affecting the work, does hereby propose to furnish all required equipment in accordance with the Bid Documents as prepared by Intermountain Consumer Professional Engineers, Inc., within the time set forth and at the price stated below. This price is to cover all expenses incurred in providing the equipment as specified in the Bid documents.

I/We acknowledge receipt of the following addenda:

<u>Addenda No.</u>	<u>Date Received</u>
_____	_____
_____	_____
_____	_____
_____	_____

1.1 BASE BID

I/We agree to provide three (3) Relay Panels as outlined for the Grapevine Substation in accordance with project Bid Documents for the lump sum amount shown below.

_____ Dollars (\$ _____)
(In case of discrepancy, written amount shall govern)

The previous lump sum amount is comprised of the following:

NO.	ITEM	UNIT	UNIT PRICE	UNIT	TOTAL PRICE
1	Panel P1	LS	_____	1	\$ _____
2	Panel P2	LS	_____	1	\$ _____
3	Panel P3	LS	_____	1	\$ _____
4	Shipping	LS	_____	1	\$ _____

TOTAL BID..... \$ _____
(Unit price must match total shown in Section 1.2)

Delivery shall be _____ weeks from receipt of purchase order.

1.2 BID SUMMARY

SUBSTATION RELAY PANEL SUMMARY

PANEL ID	MATERIAL	LABOR	TOTAL MATERIAL & LABOR
Panel P1	_____	_____	_____
Panel P2	_____	_____	_____
Panel P3	_____	_____	_____
Shipping	_____	_____	_____
TOTAL	_____	_____	_____

* Bidder is to attach their quoted material list indicating equipment part numbers etc. along with this quote.

1.3 MISCELLANEOUS

A. SUBSTITUTIONS

The following substitutions of materials and/or equipment are proposed (add additional sheets if required):

<u>Item</u>	<u>Manufacturer and Description</u>	<u>Add/Deduct</u>
_____	_____	\$ _____
_____	_____	\$ _____
_____	_____	\$ _____

<u>Item</u>	<u>Manufacturer and Description</u>	<u>Add/Deduct</u>
		\$
		\$

B. EXCEPTIONS/ALTERNATES (add additional pages if required):

Bidder _____
By _____
(Signature)

(Printed or Typed)
Title _____

Complete Business Address of
Bidder:

Name, Address, Email Address and
Telephone Numbers of Person to
Contact Regarding this Proposal.

PART 2 - GENERAL REQUIREMENTS

2.1 PURPOSE

These General Requirements detail data and other requirements applicable to the purchase, design, shipment, testing and service engineering for the equipment described in the Notice to Bidders that is to be purchased by Washington City.

2.2 BID

- A. Firm prices shall be quoted. The Bidder's bid shall not include sales or use taxes. Any price escalation factors employed to establish an invoice price shall be clearly stated and fully explained on the Bid Forms.
- B. **The Purchaser reserves the right, without cause, to accept or reject any or all bids, or any portion thereof.**
- C. The Purchaser reserves the right to waive minor irregularities or minor errors in any bid if it appears to the Purchaser that such irregularities or errors were made inadvertently. Any such irregularities or errors so waived must be corrected in the Bid in which they occur prior to the issuance of a Notice of Award and Purchase Order.
- D. All Bidders will be notified of any changes in the Bid Documents by addendum letters. Receipt of addendum letters must be acknowledged on the Bid forms.

2.3 BID EVALUATION

- A. Price and delivery are only two factors that the Purchaser may consider when evaluating bids. Other items which may be considered in the bid evaluation include, but are not limited to:
 - 1. The Bidder's past performance(s) in providing similar equipment and meeting quoted deliveries.
 - 2. The Bidder's past ability and willingness to solve problems that have arisen in a satisfactory and complete manner.
 - 3. The Bidder's deviations from the specification(s).
 - 4. Manufacturer's order cancellation policy.

2.4 PURCHASE ORDER

- A. It is anticipated that a Notice of Award and Purchase Order will be issued to the successful Bidder(s) within ninety (90) days after the date for the receipt of bids. All bids shall remain valid for this period of time.

2.5 DELIVERY AND SHIPPING

- A. The date of shipment shall be as promised by the Bidder, based upon prompt receipt of all necessary information. The date of shipment shall be defined as the date the bill of lading is signed by the carrier.
- B. Delivery date(s) will be a prime consideration during the bid evaluation process. Any change in the delivery date shall be reported immediately by telephone, followed by a written confirmation and explanation thereof. The delivery date shall be extended for the period of any reasonable delay due exclusively to causes beyond the control and without the fault of the Bidder.
- C. Shipping shall be FOB job site. The title to the equipment furnished hereunder shall pass to the Purchaser at the destination point. Final delivery location shall be coordinated with Washington City prior to shipment.

- D. On the same day that any shipment to the Purchaser is originated, the following shall be forwarded to the Purchaser:
 - 1. Packing List - Two (2) copies.
 - 2. Bill of Lading - Original and two (2) copies.
 - 3. Packing list shall also accompany each shipment.
- E. Purchaser shall be notified of the whereabouts of the equipment 48 hours prior to its scheduled arrival at the destination point. Supplier shall pay all costs associated with unloading in the event that the equipment is not on site at the notified time.
- F. If the equipment is delivered on a Friday, unloading may not occur until the following Monday. Layover costs shall be paid by the Supplier.

2.6 INVOICING

- A. Invoices shall be submitted in triplicate to:

Rick Hansen, Power Director
Washington City
111 North 100 East
Washington City, UT 84780

2.7 TITLE

- A. The title to the material and apparatus furnished hereunder shall be listed as follows:

Washington City
111 North 100 East
Washington City, UT 84780

2.8 PAYMENT

- A. Upon the shipment of any equipment hereunder, the Seller shall submit to the Purchaser, a detailed invoice in triplicate for the equipment shipped. The Purchaser shall make payment to the Seller after delivery of the equipment.

2.9 CANCELLATION

- A. In the event the Purchaser shall be required, or deems it advisable, to suspend or terminate the work being performed pursuant to these Bid Documents, the Purchaser may do so at any time by written notice to the Bidder. In such cases, the Bidder shall take whatever action with respect to work in process as would minimize its claim against the Purchaser. The Purchaser shall pay the Bidder a reasonable suspension or termination charge for all disbursements or expenses which the Seller has incurred or become obligated for prior to the date of notice of cancellation, less the reasonable resale value of the materials and apparatus which shall have been obtained or ordered to become an integral part of the work, and excluding any allowance for anticipated profits on the unperformed portions of the work. The reimbursement portions of this section do not apply to cancellations caused by design changes by the Manufacturer not authorized by the Purchaser or delivery of material beyond the quoted delivery date(s) not authorized by the Purchaser.

2.10 EXCEPTIONS/ALTERNATES

- A. Any exceptions to the requirements of the Specification(s) shall be clearly stated in the Bidder's bid and as provided for in the Bid Forms. The fact that there are exceptions will not necessarily preclude the selection of the Bidder's bid. Any exceptions shall be itemized in the bid. If no exceptions to the Bid Documents are taken by the Bidder, this shall also be clearly stated.

- B. Alternative offerings will be considered, but they must clearly be indicated as alternatives.

2.11 WARRANTY

- A. Manufacturer shall warrant to Purchaser that the equipment and/or services to be furnished hereunder are newly manufactured, are of the highest quality, are free from defects in material, workmanship, and title, and will be of the kind described in the Bid Documents. The Manufacturer's minimum warranty shall be for a period of twelve (12) months after date of line energization or eighteen (18) months after the date of shipment to Purchaser, whichever occurs first. Terms of Manufacturer's warranty shall be included in the bid and will be a criterion for evaluation of the bid. Any on site pre-energization tests or inspections required by the manufacturer for warranty purposes shall be performed by the manufacturer or its representative. The cost for warranty related on-site inspections and/or testing shall be included in the Bidders' bid.

2.12 STANDARDS

- A. Unless otherwise stated, the latest revisions of the standards of ANSI, NEMA, IEEE, ASTM, NEC, UL, and OSHA, shall be met in the testing, and manufacture of the equipment.

2.13 INSPECTION

- A. The Purchaser and/or a representative of the Purchaser shall be allowed free access at all reasonable times to the Manufacturer's facilities and those of his/her suppliers for inspection of the equipment and to obtain information on the progress of the work. Such inspection, however, shall not relieve the Manufacturer from responsibility for the quality and correctness of the work. Any work or material found to be defective or which does not meet the requirements of the Bid Documents may be rejected and shall be replaced by the Manufacturer at his/her expense.

2.14 FIELD ENGINEERING AND TESTING

- A. The equipment shall be tested by the Manufacturer. Certified copies of the test reports shall be emailed to the Purchaser following testing of the equipment.
- B. **The costs and expenses associated with field testing (if any) required for the Sellers warranty before the equipment is energized, shall be included in the firm price quoted for the equipment.**
- C. Field tests at time of installation shall be made at the expense of the Purchaser. If for any reason whatsoever the equipment furnished and installed hereunder, does not meet in any respect the specification(s) included herein and/or the performance specified by the Bidder in the bid, and it becomes necessary for the Manufacturer to make alterations for the purpose of meeting the specifications and/or performances, additional tests required to demonstrate the effectiveness of such alterations shall be performed at the expense of the Manufacturer. Any costs and expenses associated with field service personnel or testing required, by the manufacturer, for warranty purposes shall be provided by the manufacturer and shall be included in the equipment price.
- D. The relay equipment package shall be assembled and tested at the factory for satisfactory alignment, operation, and electrical integrity. Copies of the test reports shall be emailed to the Purchasers Engineer following testing of the equipment.
 - 1. Test reports shall include relay operating points, marked AC and DC schematics indicating current and voltage injection and inner panel AC and DC test points, check list indicating verification of trip, close, and lockout circuits.
 - 2. Testing shall further include:

- a. All tests required to verify correctness of assembly and operation, including but not limited to, secondary current injection on each phase at field wiring terminal connection points with verification of current at each appropriate inner panel termination point; "Trip Circuit" verification at field wiring terminal points, verified by tripping control and protective devices; "Close Circuit" verification at field wiring termination points, verified by closing control switch; lockout relay electrical operating and logic verification; protective relay functional testing as indicated in relay manufacture maintenance and testing procedure.
- b. High potential tests.
- c. All DC circuits energized with voltage verification at inner panel locations.
- d. Applicable NEMA and IEEE standard tests.

2.15 DRAWINGS AND DESCRIPTIONS

- A. Construction and wiring diagrams, as found in Part 7 of this specification are to be considered a part of the specification. **The drawings provided are for bid purposes only and are subject to revision. The successful bidder will be provided with finalized drawings.**
- B. As a part of the project, the successful Bidder must provide the following drawings:
 - 1. **Dimensioned general arrangement drawings showing the overall dimensions and relative location of all principal parts.**
 - 2. **Panel construction drawings that include panel construction details, cable entrance, interior attachment methods, and structure design.**
 - 3. **Wire termination diagram (Wire connection diagrams to be in accordance with AC schematics and DC elementary drawings as provided to the successful bidder). The panel vendor will be provided panel layout and schematic drawings only. The panel vendor is responsible for developing point to point drawings for wires between relays, test switches, terminal blocks etc.**
- C. Drawings shall be in sufficient detail to indicate the kind, size, arrangement, weights of each component, breakdown for shipment, and operation of component materials and devices; the external connections, anchorages, and supports required; the dimensions needed for installation and correlation with other materials and equipment; and the information specifically requested within this specification.
- D. Connection and interconnection wiring diagrams furnished by the Manufacturer shall be as indicated in ANSI Y14.15a-1971, Section 15-11, Article 15011.3.2.1 and Figure 11-4 except that function information and wire run code are not required. Each device connection shall have, near each termination conductor identification consisting of the opposite end destination. 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.
- E. Information indicated on the Manufacturer's drawings shall include wiring of the individual panel items as they actually will appear on the panel, contact arrangements of switches (used and unused contacts shall be identified), and internal elementary wiring of relays and instruments including test switches located within the relays specified.
- F. Elementary diagrams shall be cross-referenced to terminal markings on the connection and interconnection diagrams, but need not indicate complete details of circuits external to the panels. Each item of panel mounted equipment indicated on the diagrams shall be identified by item number and name.
- G. Sufficient space shall be left on the Purchaser's side of outgoing terminal blocks for adding field wiring cable color codes and circuit numbers. Color codes and circuit numbers will be added by the Engineer.
- H. Wiring diagrams shall be prepared on sheets 24 inches by 36 inches.
- I. Correspondence

1. Correspondence forwarding engineering data including drawings shall be addressed to the Engineer and the Purchaser as follows:

Engineer

Mac Fillingim

Email: mac.fillingim@icpeinc.com

Purchaser

Rick Hansen

Email: rhansen@washingtoncity.org

2. Letters of transmittal shall accompany all submittals of engineering data and shall include a list of the data included in the transmittal. Lists shall include manufacturer's drawing numbers identified with the corresponding project equipment or structure nomenclature as applicable. All correspondence shall be identified with the substation project name, specification number, and manufacturer's order number.

J. Drawing Submittal

1. Review drawings shall be submitted as indicated in 2.16 "Engineer Review."
2. Upon receipt from the Engineer of drawings marked NO EXCEPTIONS and with field circuit designations, the Manufacturer shall transmit via email each drawing to the Engineer for distribution. However, if during the submittal process, the Manufacturer makes further changes to drawings that have been reviewed by the Engineer, the changes shall be clearly marked on the drawings and submittal process shall be repeated.
 - a. Within two weeks prior to the shipment of Equipment, the manufacturer shall furnish final drawing as follows:
 - (1) To the Purchaser's Engineer:
 - a) Email one (1) set of computer drawing files in AutoCAD format version 2014 or later.
 - (2) In addition, the manufacturer shall ship one (1) complete set of drawings and instruction manuals (see 2.17 for manual requirements) with the relay panels. This material shall be enclosed in a weather-proof package securely attached to the unit and protected from loss or damage.

2.16 ENGINEER REVIEW

- A. After award of the purchase order, and prior to panel construction, the Manufacturer shall submit via email to the Engineer one (1) complete drawing set for each relay/control panel provided under this specification. The drawings shall be submitted for review and should be sent to the Engineer as specified in 2.15.I.
- B. A copy of reviewed drawings will be returned to the Manufacturer. Copies of drawings returned to the Manufacturer will be in the form of a print with the Engineer's marking.
- C. When drawings and data are returned marked EXCEPTIONS NOTED, the changes shall be made to the drawing as noted thereon at no additional cost to the Purchaser and resubmitted for review.
- D. When a drawing is reviewed and required revision, the Manufacturer shall revise and resubmit the drawing, the Manufacturer shall include an issue number and revision description in the drawing revision block.
- E. No work shall be performed in connection with the fabrication or manufacture of equipment and materials until the drawings and data have been reviewed by the Engineer except at the Manufacturer's own risk and responsibility. Work may proceed on equipment marked NO EXCEPTIONS NOTED or when drawings have been returned marked EXCEPTIONS NOTED, provided the work is performed in accordance with the Engineer's notations.

- F. The Engineer's review of engineering data will cover only general conformity of the data to the specifications and documents, external connections, interfaces with equipment and materials furnished under separate specifications and dimensions which affect substation arrangements. The Engineer's review does not indicate a thorough review of all dimensions, quantities, and details of the equipment, material, device, or item indicated or the accuracy of the information submitted; nor shall review by the Engineer be construed as relieving the Manufacturer from any responsibility for errors or deviations from the requirements of the bid documents and specifications.
- G. As noted in 2.15G, during the Engineer's review, the Engineer will modify the drawings with outgoing circuits, circuit numbers, and color codes. The Engineer shall be responsible for adding the color codes, circuits, and circuit numbers to the drawings.

2.17 INSTRUCTION MANUALS

- A. Instruction manuals for the unloading, storage, installation, operation, and maintenance of the equipment shall be furnished. Within two weeks prior to the shipment of equipment, the manufacturer shall furnish:
 - 1. To the Purchaser's Engineer – Email one (1) electronic copy of the complete instruction manual.
 - 2. In addition, the manufacturer shall ship one (1) complete hard copy of the instruction manual with the relay panels. The manual shall be enclosed in a weather-proof package, securely attached to the unit and protected from loss or damage.
- B. Content
 - 1. Manuals shall include the following information specific to the furnished equipment:
 - a. Table of Contents and index tabs
 - b. Specifications, test data, and curves
 - c. Description of the equipment
 - d. Component instruction books
 - e. Instructions in the methods of receiving, inspection, storage, and handling prior to installation
 - f. Installation instructions
 - g. Operating instructions
 - h. Maintenance instructions
 - i. Assembly drawings
 - j. Parts list
 - k. Nameplate information and shop order for each item of equipment and component part thereof
 - l. List of recommended of spare parts
 - m. List of maintenance tools furnished with the equipment
- C. The above listed requirements are minimum; however, requirements which are clearly not applicable to the equipment may be deleted. Additional information which is necessary for proper operation and care of the equipment shall also be included.
- D. Binding:
 - 1. Each hard copy of the manuals shall be assembled and bound in a 3" 3 ring binder.
- E. Binder capacities shall not exceed 3 inches, nor shall material included exceed the designed binder capacity. If material to be bound exceeds capacity rating, multiple volumes shall be furnished. Binder capacity should not be more than approximately ½ inch greater than the thickness of the material within the binder
- F. Submittal:

1. One complete electronic copy of the proposed manual shall be submitted via email to the Engineer for review. The Engineer's review will be for general conformity to specified requirements and is not intended to constitute detailed review or approval of content.

2.18 ARBITRATION

- A. The parties agree that all disputes concerning transactions covered by the general requirements and the bid shall be submitted to binding arbitration under the Commercial Dispute Rules for arbitration of the American Arbitration Association or, to such other arbitrators the parties may agree upon using such arbitration rules as deemed by the arbitrator to be appropriate under the circumstances.

PART 3 - GENERAL REQUIREMENTS FOR RELAYING EQUIPMENT

3.1 GENERAL

B. Relaying and Panel Equipment. The following equipment is to be provided:

1. Panel structure
2. Relays, equipment, auxiliary devices, and material of type as indicated on the drawings and within this specification.
3. Terminal blocks as required and indicated on the drawings and within this specification.
4. CT shorting blocks as indicated within this specification.
5. Control switch and indicating lights of type as indicated on the drawings.
6. Auxiliary relays, lockout switches, and all necessary connections, wiring and devices.
7. The panel is to have all devices installed and be completely wired in accordance with the schematic and wiring diagrams. If deviation from Engineers drawing is necessary, the "For Record" set of drawings shall indicate changes. Drawings provided shall be as indicated in paragraph 2.15, B and throughout sections of this specification.
8. Miscellaneous spare materials as indicated herein.

3.2 WARRANTY

- A. Equipment shall be warranted by the vendor against defective material, poor workmanship, design deficiencies, and failure from normal usage for a minimum of one year after being placed in service or eighteen months after date of shipment. The manufacturer shall repair or replace any defective parts of equipment, and shall repair, without expense to Purchaser, any damage resulting from poor workmanship or faulty design found within this time period.

PART 4 – EQUIPMENT SPECIFICATION

4.1 RELAY PANEL STRUCTURE

- A. Steel relay panels shall be provided with proper dimensions for equipment requirements. The panels shall have general construction in accordance with the Drawings and the Bidder's approved panel construction drawing. The bidder is responsible for verifying dimensions, prior to panel construction, to insure proper fit of relays and controls.
- B. The panels shall be enclosed type. The panels shall have semi-flush mount devices. The panel shall be constructed so that complete access to terminal blocks and relay wiring is available. **The panels shall contain wire ways for field to panel and for panel to panel wiring connection requirements.**
- C. The panels shall be equipped with copper ground bars suitable for grounding connections. Ground bars shall be provided to connect between adjacent panel sections.
- D. Finished panel surface shall be free of wave, bellies, and other imperfections. Surfaces shall be cleaned and treated before application of finish. A high-quality, corrosion-resistant, multi-coat paint finish will be used on all surfaces. The exterior finish paint color shall be ANSI 61, light grey.

4.2 PANEL LAYOUT

- A. Relays, control switches and meters will be semi-flush mounted on the panel front. A general arrangement for relays and panel equipment is shown in the drawings. This arrangement may be altered for better use of space and to accommodate the proposed relaying equipment. However, any alteration must be approved by the purchaser's Engineer.
- B. Equipment shall be arranged, wired, and connected in a neat and orderly manner allowing full access to all devices for operation and maintenance. The wiring and connection shall be in accordance with Engineer furnished drawings and the panel builder's inter panel connection diagrams.
- C. All wiring terminations shall be identified by legible markings on the device terminals and by printing on wire sleeves. The printing on each wire sleeve shall indicate opposite end termination point. The wire sleeves shall be heat-shrinkable, tubing marked in typed characters and affixed to the wire with a heat source to resist movement of the marker sleeve. The tubing and typed marks shall be resistant to hydrocarbons. The typed marks shall be treated to resist deterioration. Other approved permanent wire marking methods are acceptable. Adhesive wire labels are not acceptable. All wiring leaving a cubicle shall leave from terminal blocks or fuse blocks, not from other devices in the cubicle. Wire markings shall be visible without requiring the movement of the wires or labels.
- D. Wiring shall be Type SIS copper switchboard wire, #12 AWG minimum for CT circuits, #14 AWG minimum for control wiring and #14 for annunciator wiring. Transducer output wiring shall be shielded twisted pair to terminal blocks. Where practical, field wiring termination points for specific equipment shall be grouped.
- E. Terminal blocks such as General Electric type EB-25 or approved equal shall be provided for all external connections for controls, and relays. Terminal blocks shall have tin or zirconium plated screw-type terminals to accommodate insulated seamless compression ring-type tongue lugs, which shall be used for wiring terminations. Terminal blocks shall be rated 20 amps and 600 volts minimum and a maximum of two wires shall terminate at each screw-type terminal. Yellow insulated seamless compression ring-type tongue lugs shall be provided on all current transformer circuits. Terminal blocks for current transformer circuits shall be 4 point short circuiting type (General Electric type EB-27 or approved equal). Terminal blocks shall be supplied with four shorting screws. A minimum of 4 spare 12-point terminal blocks shall be provided in each panel.

- F. Exterior nameplates are to be installed in accordance with Drawings. The panel will be identified with a master nameplate. Device nameplates will identify all relays, meters, indicating lights and switches. Nameplates will be made from black laminated plastic with white core and shall be installed by screws. Interior device designation shall be attached above the devices, terminal block, switch, etc. by permanent adhesive. The designation shall be in accordance with the panel devices designation as shown on wiring diagrams. Individual test switches labels shall be required as indicated.
- G. An adequate raceway system shall be provided for all wiring on each side of the panel. A complete system of separate vertical raceways shall be provided for factory and field wiring. The raceway for factory wiring shall be sized so that fill does not exceed 30%. Wiring raceways shall be Panduit plastic wiring duct with covers.
- H. Test switches shall be provided as indicated. Manufacturer to be ABB or AVO States.
- I. All indicating lamps shall be LED type.
- J. All relays and equipment in the panels shall be provided and installed by the panel manufacturer.

4.3 PANEL WIRING AND TERMINATIONS

- A. The relay panel shall be wired as shown in the schematic drawings and in accordance with the panel wiring diagrams developed by panel vendor.
- B. The relay panel will be completely wired and ready for use upon delivery to the purchaser.
- C. All connections are to be made at equipment studs or terminal blocks. All CT leads are to be terminated on short circuiting type terminal blocks. All wiring is to be installed without splices.
- D. Terminal blocks are to be mounted in vertical rows on inner side panels on each side of the front panel.

PART 5 – SPARE AND MISCELLANEOUS MATERIALS

- 5.1 Each relay panel shall be provided with the following spare parts:
- A. One lot of fuses, lamps for indicating lights, and color caps as follows:
 - 1. 100% replacement of fuses.
 - 2. 100% replacement of lamps for indicating lights.
 - 3. 100% replacement of color caps.

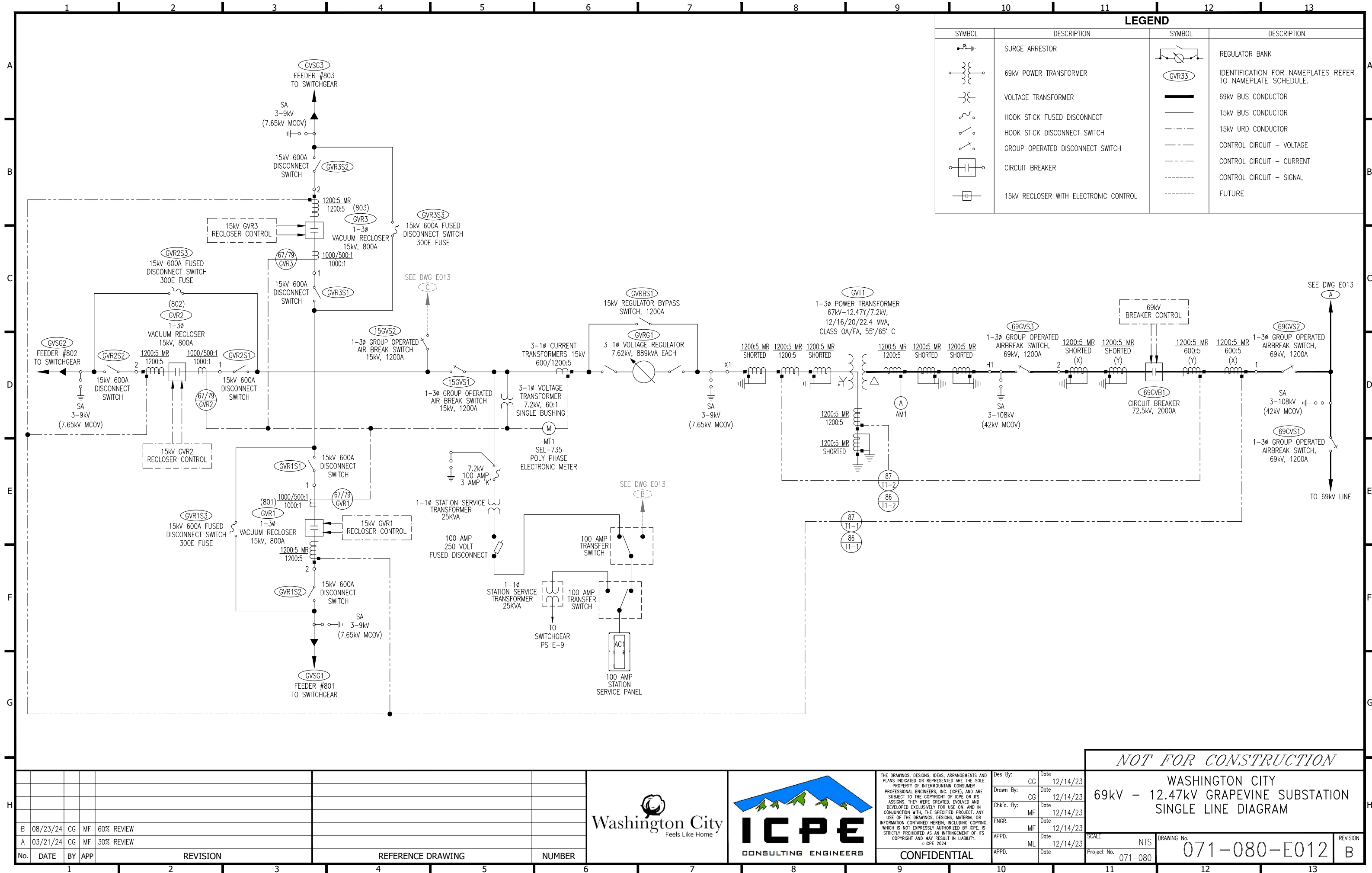
PART 6 – SHIPPING

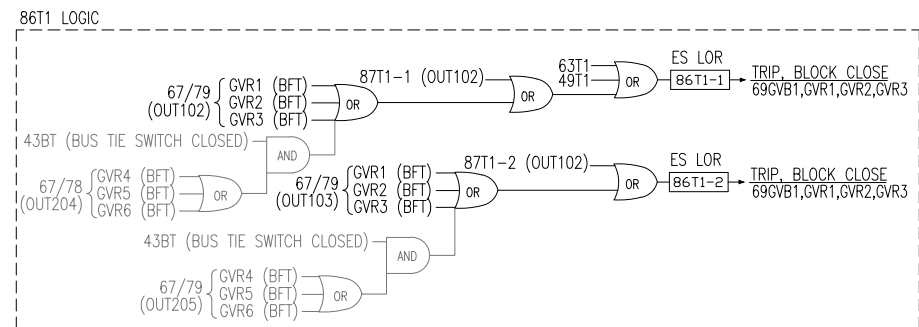
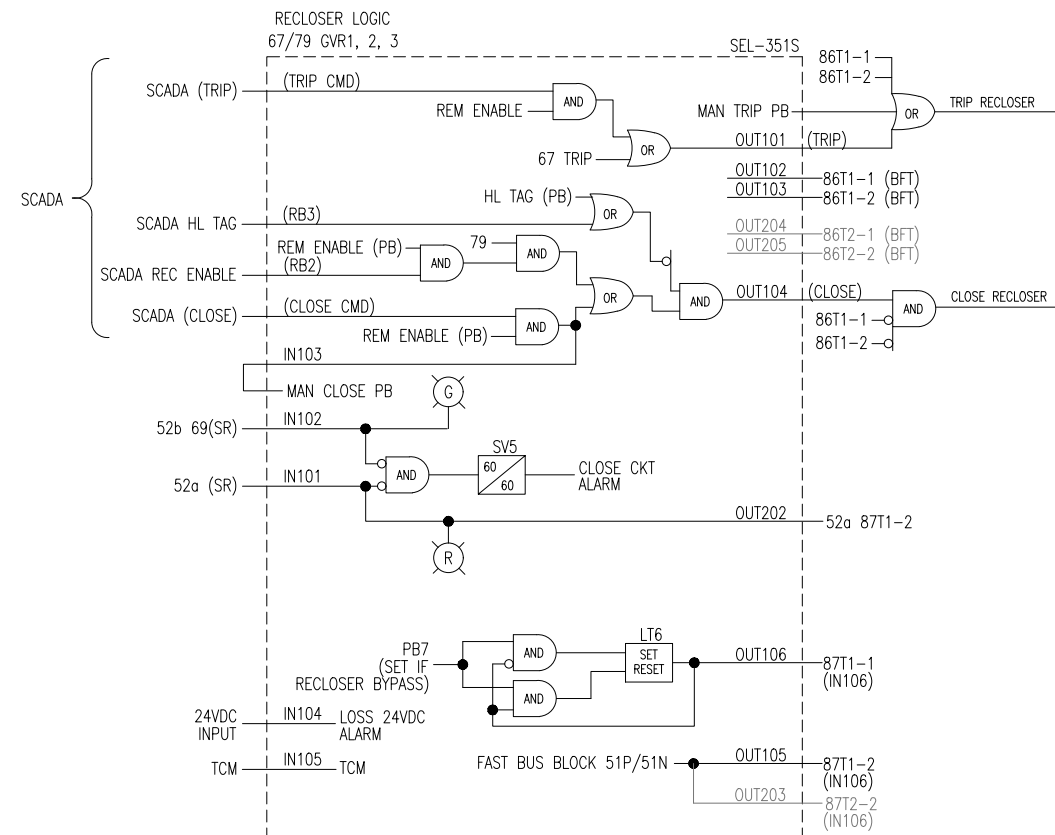
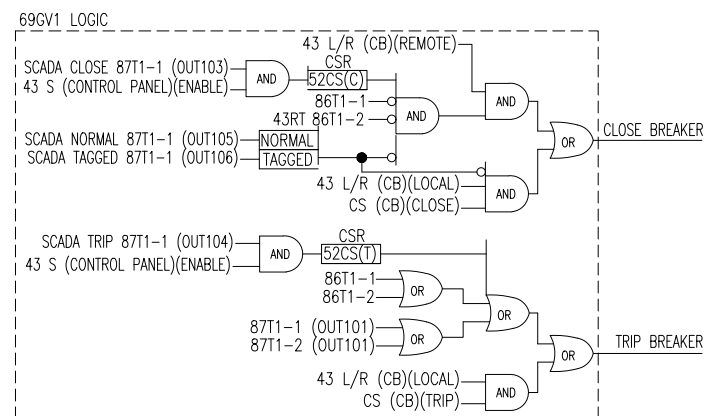
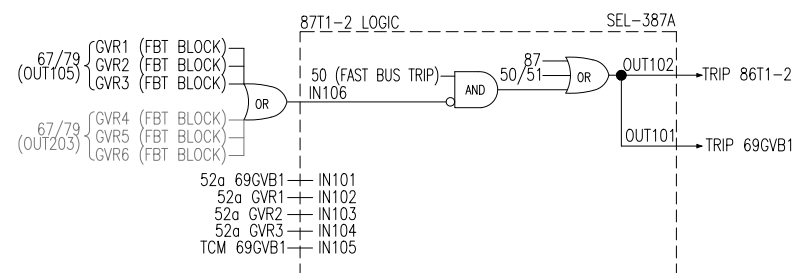
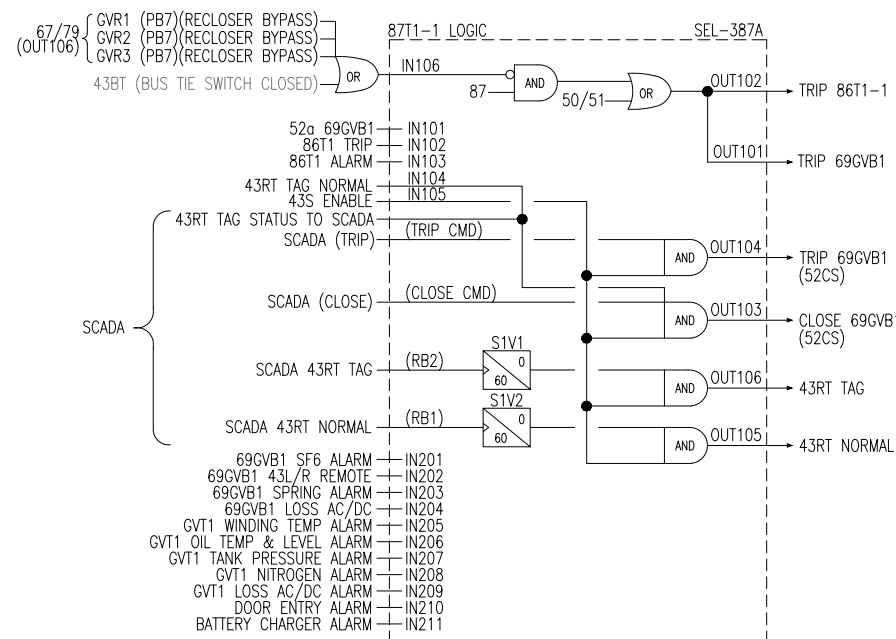
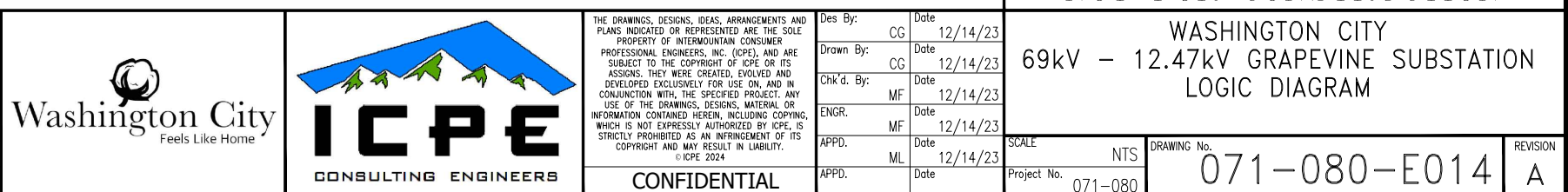
- 6.1 Equipment shall be shipped completely assembled as far as practicable. Complete instructions for the field assembly of any loose parts or sections of a lineup must accompany the shipment.
- 6.2 The Bidder shall ship per his option unless special instructions are specified on the purchase order.
- 6.3 All shipments shall be identified per instructions specified on the purchase order. All equipment shall be boxed, crated, or otherwise suitably protected during shipment, handling, and storage. Coated surfaces shall be protected against impact, abrasion, discoloration, and other damages. Surfaces which are damaged shall be repaired.
- 6.4 All shipping blocks, bindings, and other temporary materials requiring removal before energizing the equipment shall be clearly and distinctly identified. Temporary warning signs stating, "REMOVE TEMPORARY MATERIALS BEFORE ENERGIZING", shall be prominently displayed.

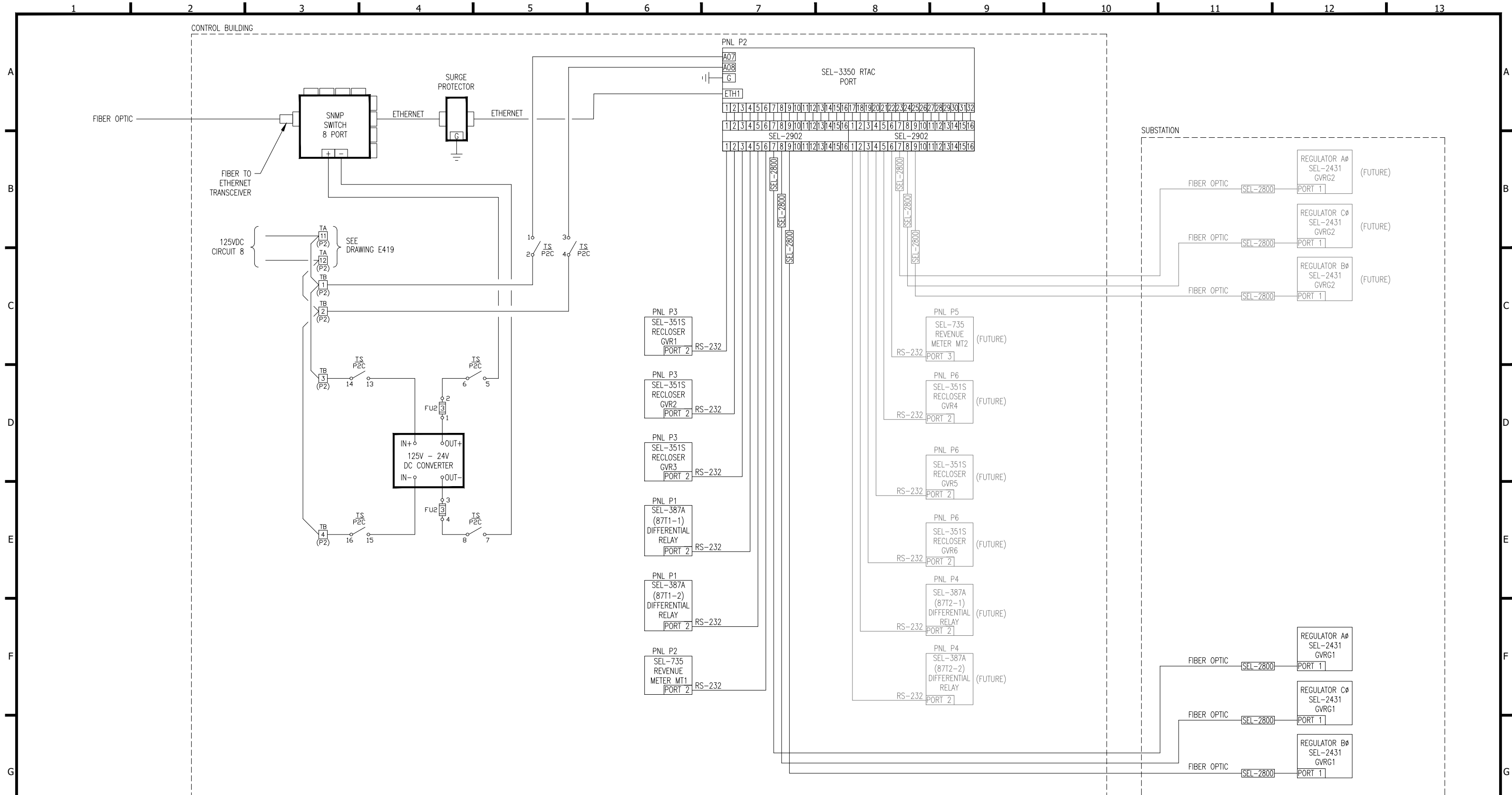
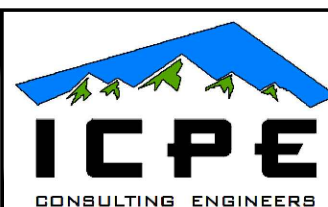
PART 7 – DRAWINGS

- 7.1 The following drawings are provided with this specification and are to be considered a part of this specification. The drawings are provided for bidding purposes and are subject to minor wiring revisions. The successful bidder will be provided finalized drawings.

<u>DRAWING NUMBER</u>	<u>DESCRIPTION</u>
E010	SIMPLIFIED SINGLE LINE DIAGRAM
E011	SIMPLIFIED SINGLE LINE DIAGRAM
E012	SINGLE LINE DIAGRAM
E014	LOGIC DIAGRAM
E015	COMMUNICATIONS BLOCK DIAGRAM
E263	AC SCHEMATICS - CONTROL PANELS
E300	THREE LINE DIAGRAM - TRANSFORMER GVT1 & BREAKER 69GVB1
E301	THREE LINE DIAGRAM - VOLTAGE REGULATOR GVRG1 & RECLOSER GVR3
E302	THREE LINE DIAGRAM - RECLOSER GVR1 & GVR2
E401	CONTROL SCHEMATIC – 69GVB1 TRIP & CLOSE
E402	CONTROL SCHEMATIC – 69GVB1 ALARMS, AC & DC POWER
E405	CONTROL SCHEMATIC - 86T1-1, DIFF. RLY 87T1-1
E406	CONTROL SCHEMATIC - DIFF. RLY 87T1-1
E407	CONTROL SCHEMATIC - 86T1-2, DIFF. RLY 87T1-2
E411	CONTROL SCHEMATIC – TRANSFORMER GVT1
E413	CONTROL SCHEMATIC - RECLOSER GVR1
E414	CONTROL SCHEMATIC - RECLOSER GVR2
E415	CONTROL SCHEMATIC – RECLOSER GVR3
E419	CONTROL DC SCHEMATIC - RTAC
E600	PANEL LINEUP
E601	PANEL P1 PANEL LAYOUT
E605	PANEL P2 PANEL LAYOUT
E609	PANEL P3 PANEL LAYOUT



[illegible]

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WASHINGTON CITY 69kV - 12.47kV GRAPEVINE SUBSTATION COMMUNICATIONS BLOCK DIAGRAM			
SCALE	NTS	DRAWING No.	REVISION
Project No.	071-080	071-080-E015	A



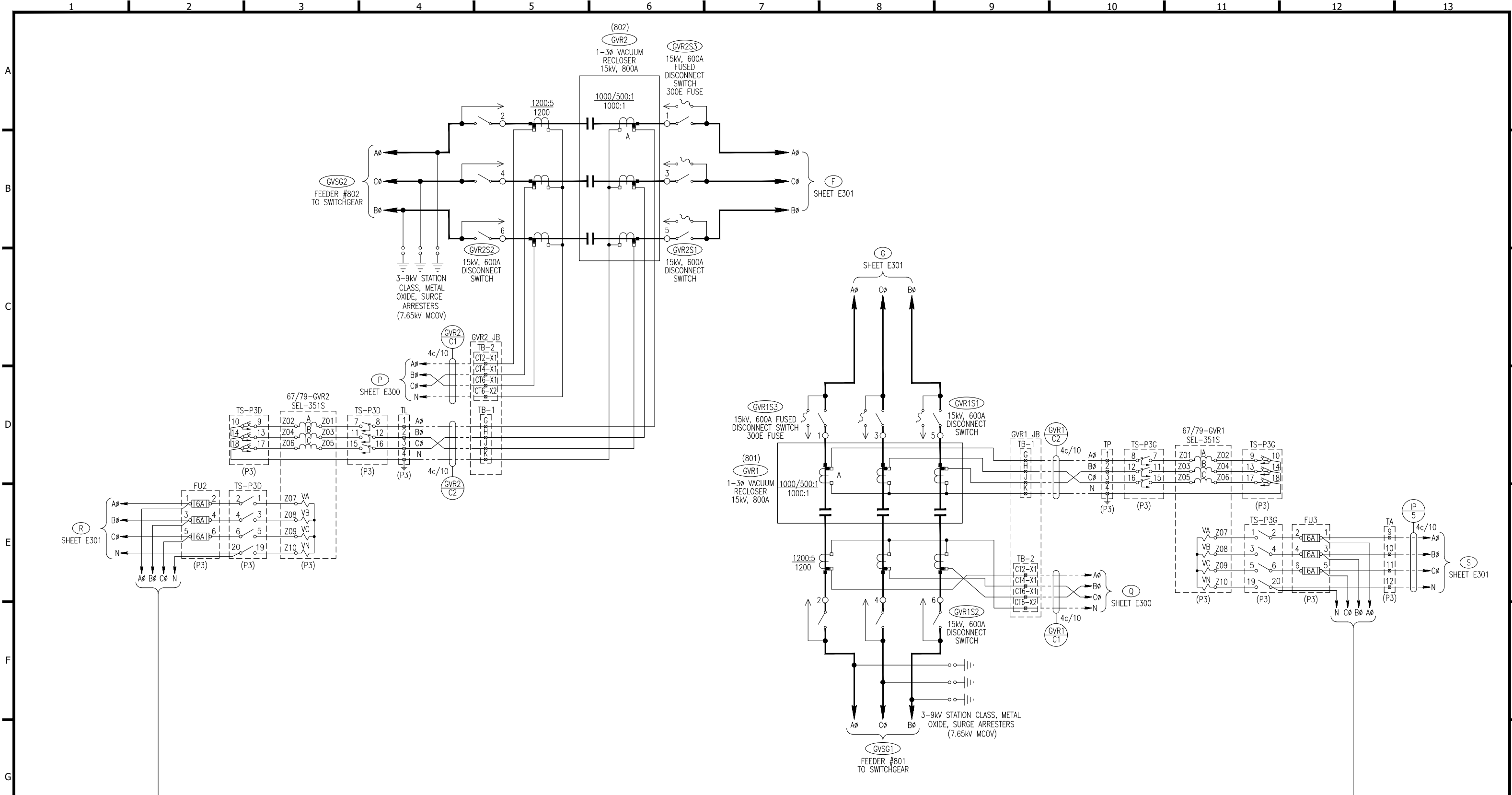
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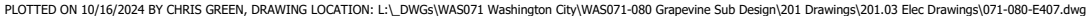
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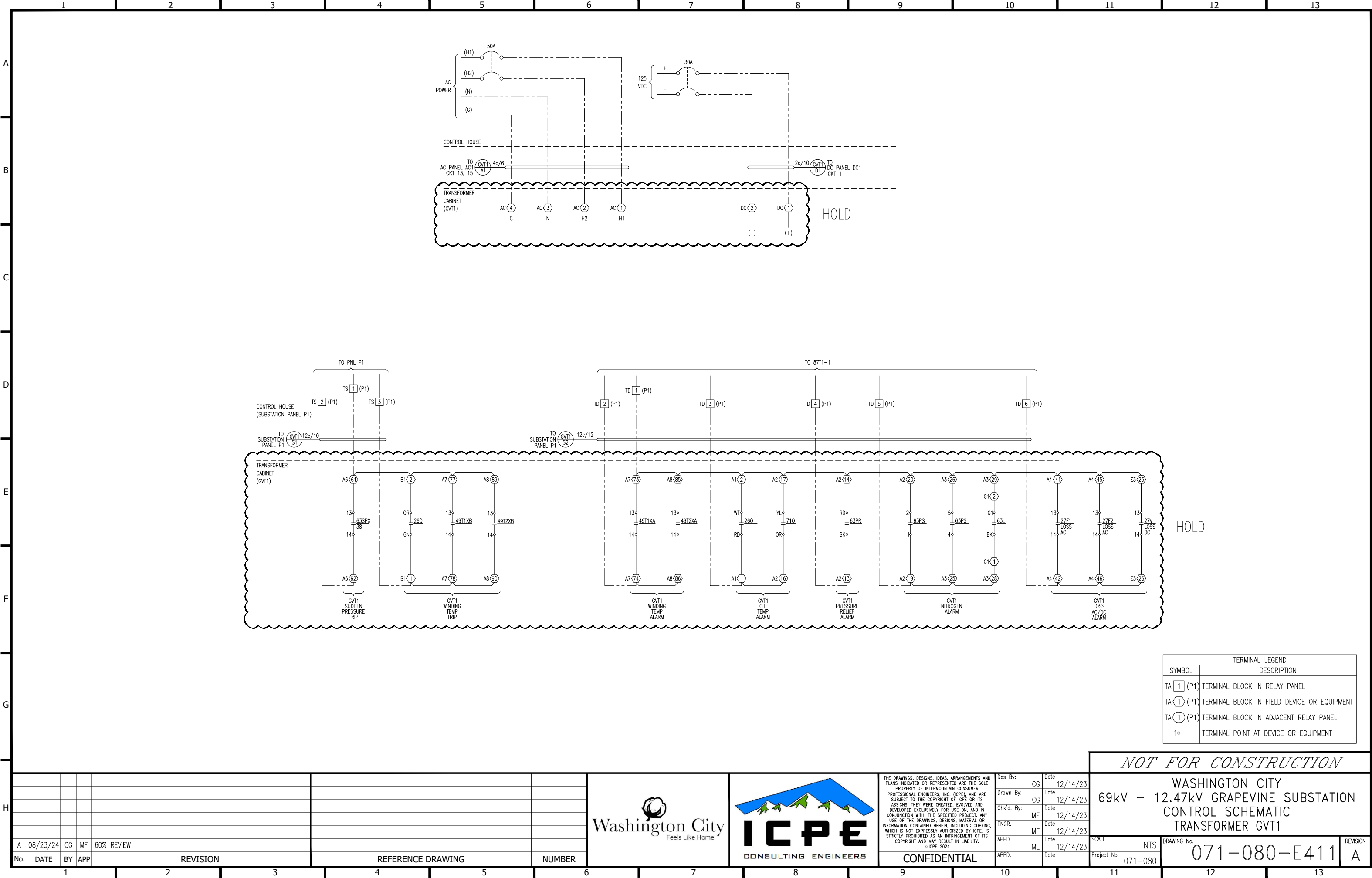
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										WASHINGTON CITY			
										69kV - 12.47kV GRAPEVINE SUBSTATION			
										THREE LINE DIAGRAM			
										RECLOSER GVR1 & RECLOSER GVR2			
										SCALE		DRAWING No.	
										NTS		071-080-E302	
										Project No.		071-080	
												B	





TERMINAL LEGEND	
SYMBOL	DESCRIPTION
TA 1 (P1)	TERMINAL BLOCK IN RELAY PANEL
TA 1 (P1)	TERMINAL BLOCK IN FIELD DEVICE OR EQUIPMENT
TA 1 (P1)	TERMINAL BLOCK IN ADJACENT RELAY PANEL
1°	TERMINAL POINT AT DEVICE OR EQUIPMENT

NOT FOR CONSTRUCTION

WASHINGTON CITY
69kV - 12.47kV GRAPEVINE SUBSTATION
CONTROL SCHEMATIC
TRANSFORMER GVT1

SCALE	NTS	DRAWING No.	071-080-E411	REVISION	A
Project No.	071-080				

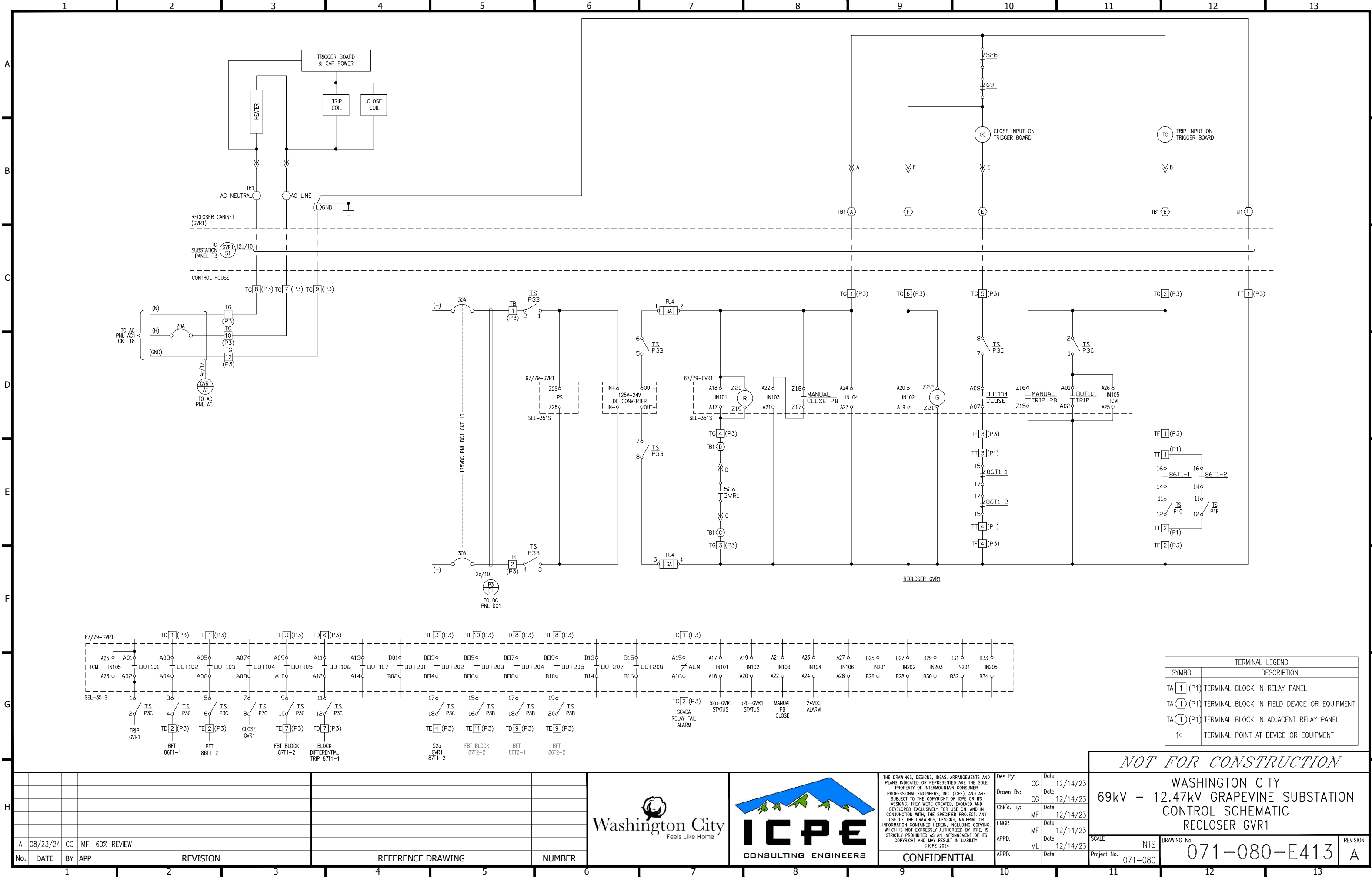
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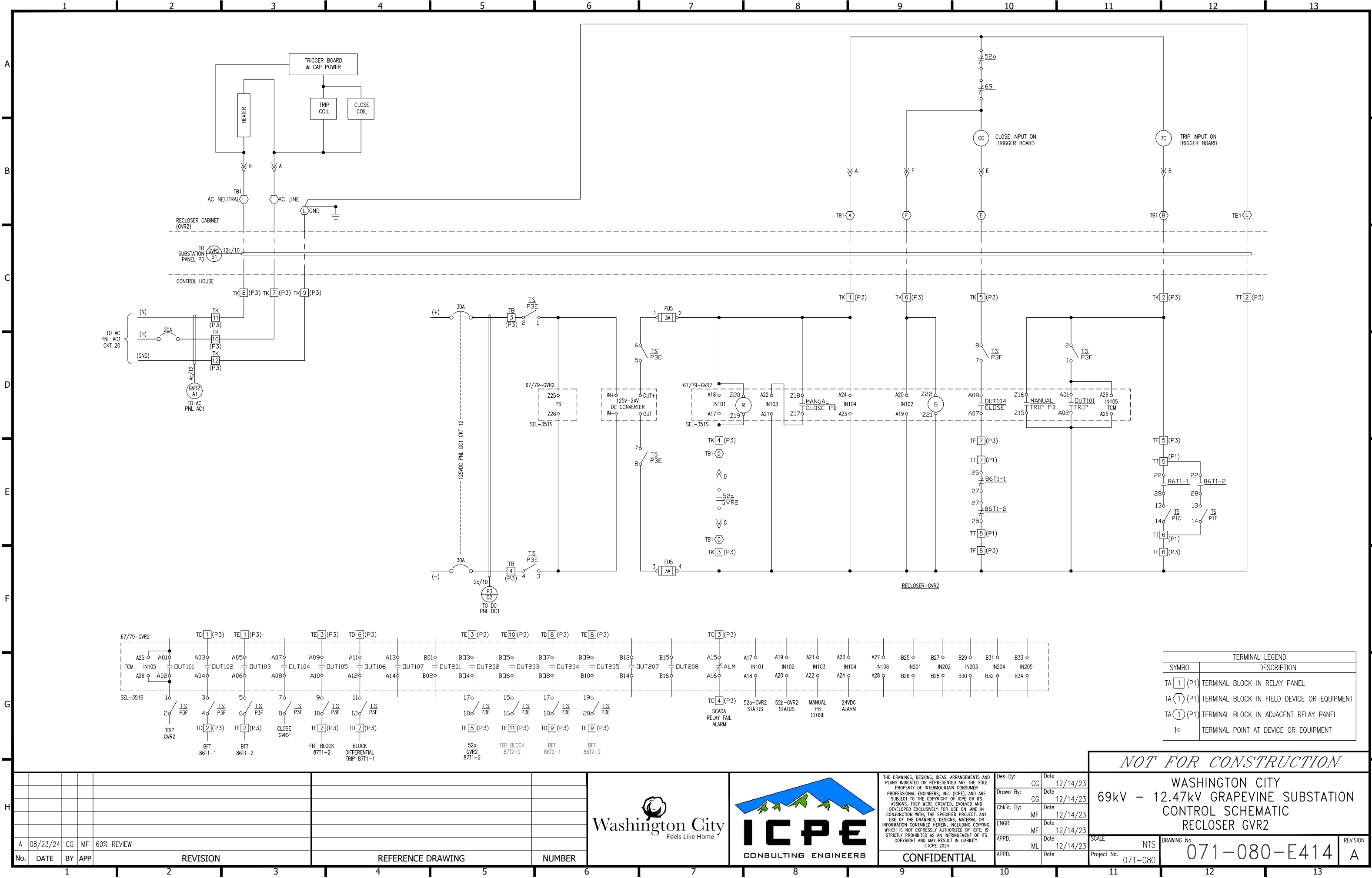


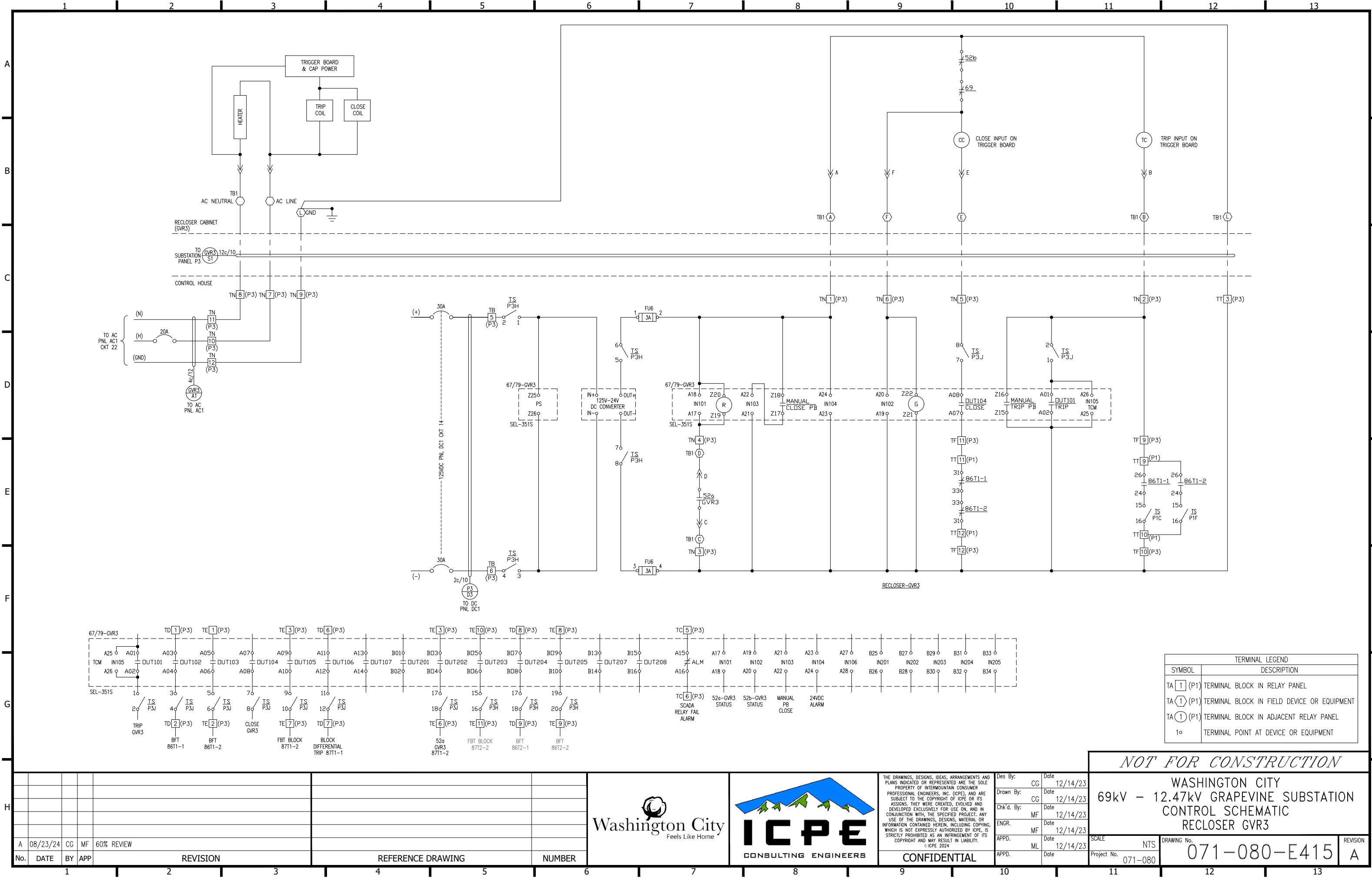
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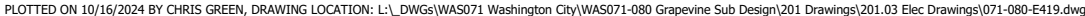
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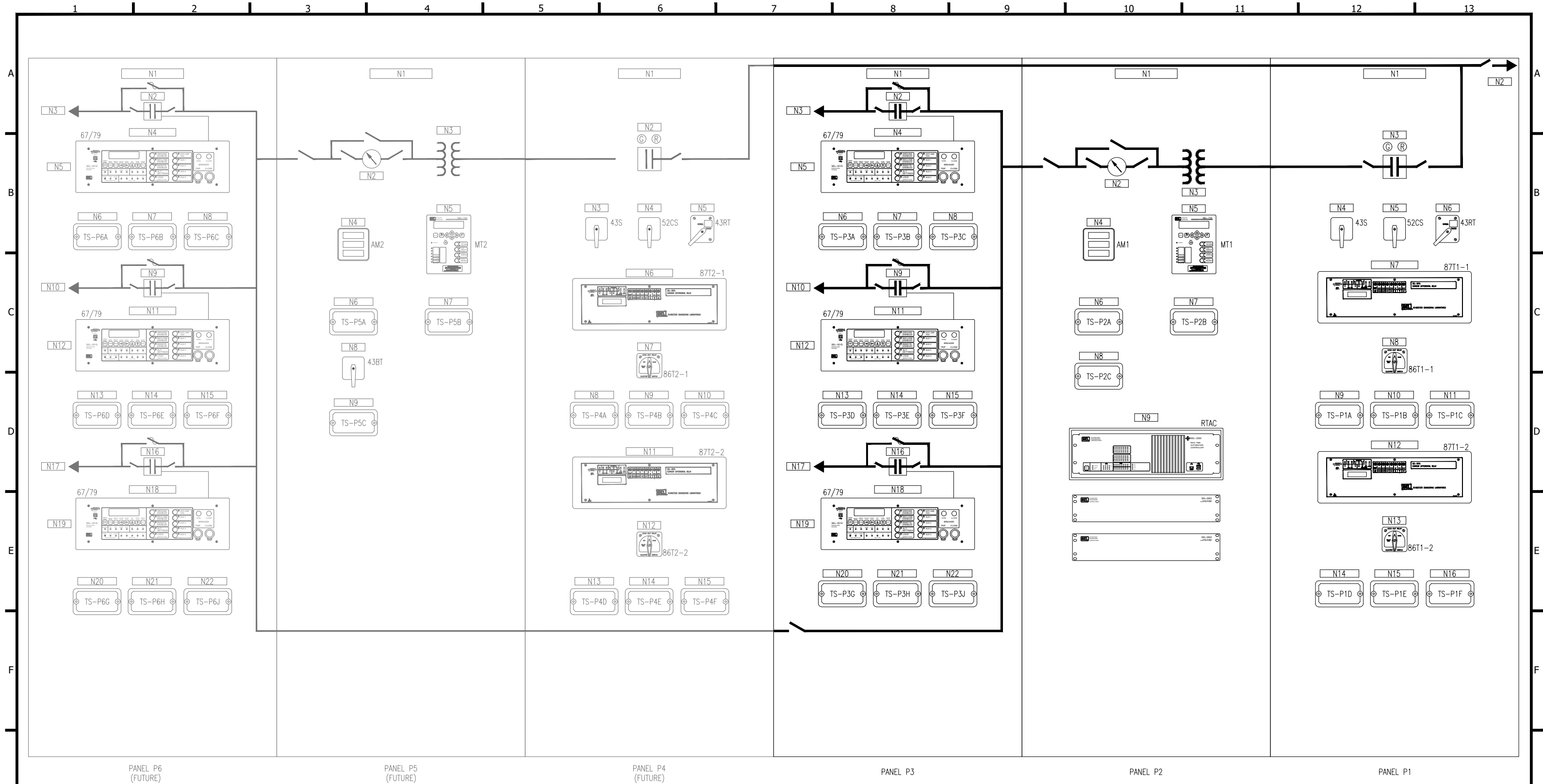
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										69kV – 12.47kV GRAPEVINE SUBSTATION									
										PANEL LINEUP									

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No.	DATE	BY	APP	REVISION		REFERENCE DRAWING		NUMBER

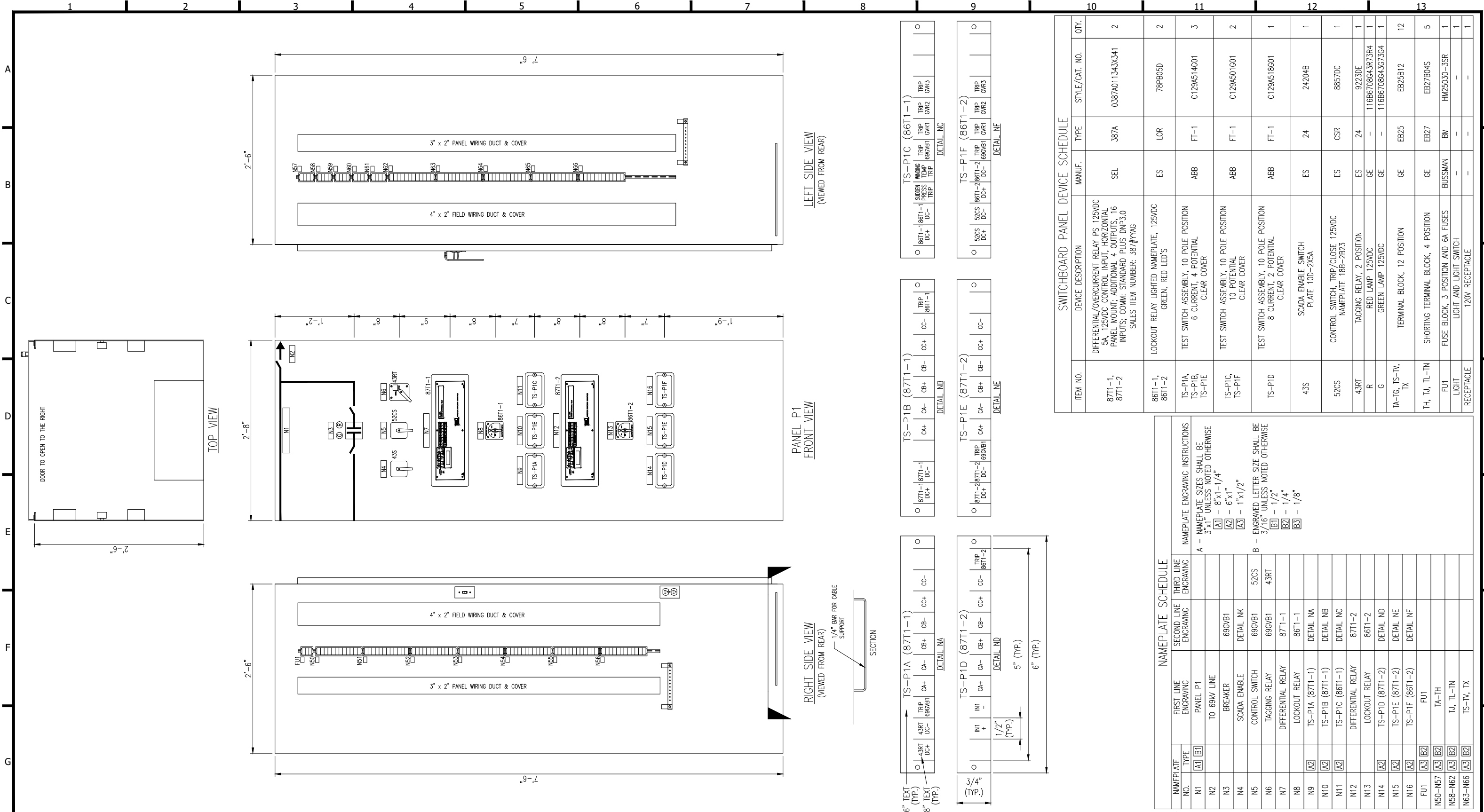


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WASHINGTON CITY 69kV – 12.47kV GRAPEVINE SUBSTATION PANEL P1 PANEL LAYOUT			
SCALE	NTS	DRAWING No.	REVISION
Project No.	071-080	071-080-E601	A



DETAIL NA

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WASHINGTON CITY			
69kV – 12.47kV GRAPEVINE SUBSTATION			
PANEL P3			
PANEL LAYOUT			
SCALE	NTS	DRAWING No.	REVISION
Project No.	071-080	071-080-E609	A

