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# Electrical Breaker And Protective Relay Testing

*for the*

*North Davis Sewer District*

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Bidding Requirements, Contract Forms, Conditions of the  
Contract, and Technical Specifications

**June 2026**

**NORTH DAVIS SEWER DISTRICT**

**PROVIDING**

**ELECTRICAL BREAKER AND PROTECTIVE RELAY TESTING**

**CONTRACT DOCUMENTS**

**INCLUDING**

**BIDDING REQUIREMENTS, CONTRACT FORMS, CONDITIONS OF THE CONTRACT,  
AND TECHNICAL SPECIFICATIONS**

**4252 WEST 2200 SOUTH  
SYRACUSE, UTAH 84075**

**Bids will be received at the office of the North Davis Sewer District located at  
4252 West 2200 South, Syracuse, Utah 84075 until 12:00 pm  
On: June 30<sup>th</sup>, 2026**



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# **Bidding Requirements**

## ADVERTISEMENT FOR BIDS

NORTH DAVIS SEWER DISTRICT  
4252 West 2200 South  
Syracuse, Utah 84075

Separate sealed BIDS for Providing Service for ELECTRICAL BREAKER AND PROTECTIVE RELAY TESTING will be received by NORTH DAVIS SEWER DISTRICT at the District Offices, 4252 West 2200 South, Syracuse, Utah, 84075, until 12:00 pm local time on June 30, 2026, and then at said office publicly opened and read aloud.

### **The Service to be provided Includes:**

ELECTRICAL BREAKER AND PROTECTIVE RELAY TESTING AS PER TECHNICAL SPECS

Term of the Service(s) Contract is for duration 180 DAYS after the commencement date stated in the Notice to Proceed. The District intends to award the contract at the next regularly scheduled Board of Trustees meeting following the bid opening and issue a Notice of Award.

The CONTRACT DOCUMENTS will be available on June 2nd , 2026 and may be examined at the following location after that date. Copies of the Contract Documents may be downloaded at [ndsd.org](http://ndsd.org).

NORTH DAVIS SEWER DISTRICT  
4252 West 2200 South  
Syracuse, Utah 84075  
(801) 825-0712

The Bidder shall guarantee the total bid price for a period of Six Months from the date of bid opening.

All communications relative to this bid and purchase shall be directed to Tom Anderson, 4252 West 2200 South Syracuse Utah, phone 385-303-1034, or e-mail [tanderson@NorthDavisSewer.gov](mailto:tanderson@NorthDavisSewer.gov) prior to the opening of bids.

The Owner reserves the right to reject any and all bids, to waive any informality in a bid, and to make award to lowest responsible bidder as it may serve the interest of the Owner.

Published: June 2, 2026.



## **INSTRUCTIONS TO BIDDERS**

### **1. DEFINED TERMS**

Terms used in these Instructions to Bidders have the meanings assigned to them in the General Conditions. The term “Bidder” means one who submits a Bid directly to Owner, as distinct from a sub-bidder, who submits a bid to a Bidder. The term “Successful Bidder” means the lowest, qualified, responsible and responsive Bidder to whom Owner (on the basis of Owner’s evaluation as hereinafter provided) makes an award. The term “Bidding Documents” includes the Advertisement, Instructions to Bidders, the Bid Form, and the proposed Contract Documents (including all addenda issued prior to receipt of Bids). “Owner” means the North Davis Sewer District.

### **2. COPIES OF BIDDING DOCUMENTS**

- 2.1** Complete sets of the Bidding Documents may be obtained by visiting [website address of Bidding Documents] and downloading the complete bid documents.
- 2.2** Complete sets of the Bidding Documents must be used in preparing Bids; Owner assumes no responsibility for errors or misinterpretations resulting from the use of incomplete sets of bidding documents.
- 2.3** Owner in making copies of Bidding Documents available on the above terms does so only for the purpose of obtaining Bids for the Service to be provided, and does not confer a license or grant for any other use.

### **3. QUALIFICATIONS OF BIDDERS**

To demonstrate qualifications to provide the services specified in the Contract Documents, each bidder must submit company profile, references of previous similar experience, present commitments and such other data as set forth in the Supplementary Conditions. Each Bid must contain evidence of Bidder’s qualification to legally do business in the jurisdiction where the Project is located.

### **4. EXAMINATION OF CONTRACT DOCUMENTS AND SITE**

- 4.1** It is the responsibility of each Bidder before submitting a Bid, to (a) examine the Contract Documents thoroughly, (b) visit the site to become familiar with local conditions that may affect cost, performance, or furnishing of the services to be provided, (c) consider federal, state and local Laws, ordinances, rules, and regulations that may affect cost, performance, or furnishing of the services provided, (d) study and carefully correlate bidder’s observances with the Contract Documents, and (e) notify Owner of all conflicts, errors, or discrepancies in the Contract Documents.



## INSTRUCTIONS TO BIDDERS

- 4.2** The submission of a Bid will constitute an incontrovertible representation by the Bidder that Bidder has complied with requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Services required by the Contract Documents and such means, methods, techniques, sequences or procedures of providing services as may be indicated in or required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the services to be provided.

### 5. INTERPRETATIONS AND ADDENDA

- 5.1** All questions about the meaning or intent of the Contract Documents are to be directed to Owner. Interpretations or clarifications considered necessary by Owner in response to such questions will be issued by Addenda; mailed, faxed or delivered to all parties; and recorded by Owner as having received the Bidding Documents. Questions received less than ten days prior to the date for opening of bids may not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations of clarifications will be without legal effect.
- 5.2** Addenda may also be issued to modify the Bidding Documents as deemed advisable by Owner.

### 6. CONTRACT TERM

- 6.1** The term of the contract to provide services specified in the contract documents is set forth in the Bid Form and the Agreement.

### 7. SUBCONTRACTORS, SUPPLIERS AND OTHERS

- 7.1** All bidders shall submit, with their Bid: a list of all Subcontractors, Suppliers and other people and organizations proposed for those portions of providing services specified in Contract Documents for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar experience and other evidence of qualification for each such Subcontractor, Supplier, person, or organization. If Owner, after due investigation, has objection to any proposed subcontractor, suppliers, other person or organization, Owner may before the Notice of Award is given request the apparent Successful Bidder to submit an acceptable substitute without an increase in Bid price. If apparent Successful Bidder declines to make any such substitution, Owner may award the contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers and other persons, and organizations. Any Subcontractor, Supplier, other person, or organization listed and to whom Owner does not make written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner, subject to revocation of such acceptance after the effective date of Agreement as provided in the General Conditions.



## INSTRUCTIONS TO BIDDERS

- 7.2 No Bidder shall be required to employ any Subcontractor, Supplier, other person, or organization against whom he has reasonable objection.

### 8. BID FORM

- 8.1 The Bid Form is included with the Bidding Documents; additional copies may be obtained from Owner.
- 8.2 All pertinent blanks on the Bid Form must be completed in ink or by typewriter.
- 8.3 Bids by corporations must be executed in the corporate name by the president or vice-president (or other corporate office accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown below the signature.
- 8.4 Bids by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature, and the official address of the partnership must be shown below the signature.
- 8.5 All names must be typed or printed below the signature.
- 8.6 The Bid shall contain an acknowledgement of receipt of all Addenda (the numbers of which shall be filled in on the Bid Form).
- 8.7 The address and telephone number for communications regarding the Bid must be shown. A FAX number and E-mail address, where available, shall also be shown.

### 9. SUBMISSION OF BIDS

- 9.1 Bids shall be submitted at the time and place indicated in the Advertisement and shall be enclosed in an opaque sealed envelope, marked with the name of the title of Services to be Provided and address of the Bidder and accompanied by other required documents. If the Bid is sent through the mail or other delivery system, the sealed envelope shall be enclosed in a separate envelope with the notation "BID ENCLOSED" on the face of it.
- 9.2 Prospective Bidders are furnished one copy of the Bidding Documents with one each of the Bid Forms. The Bidding Documents may be retained by the Bidder. The Bid Form is to be completed and submitted to Owner.



## INSTRUCTIONS TO BIDDERS

### 10. MODIFICATION AND WITHDRAWAL OF BIDS

**10.1** Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids.

**10.2** If, within twenty-four hours after Bids are opened, any Bidder files a duly signed, written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid. Thereafter, that Bidder will be disqualified from further bidding on the Services to be provided under the Contract Documents.

### 11. OPENING OF BIDS

Bids will be opened and (unless obviously non-responsive) read aloud publicly. A bid summary of the amounts of the Bids and major alternatives (if any) will be made available to Bidders after the opening of Bids.

### 12. BIDS TO REMAIN SUBJECT TO ACCEPTANCE

All Bids shall remain subject to acceptance for sixty (60) days after the day of the Bid opening, but Owner may, in its sole discretion, release any Bid prior to that date.

### 13. AWARD OF CONTRACT

**13.1** Owner reserves the right to reject any and all Bids, to waive any and all irregularities and to negotiate contract terms with the Successful Bidder, and the right to disregard all nonconforming, nonresponsive, unbalanced or conditional Bids. Also, Owner reserves the right to reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Owner to make an award to the Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by Owner.

Discrepancies between the Unit Price in figures and the Unit Price in words will be resolved in favor of the Unit Price in words. Discrepancies in the multiplication of units of Work and Unit Prices will be resolved in favor of the Unit Prices.

Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.



## INSTRUCTIONS TO BIDDERS

- 13.2** In evaluating Bids, Owners will consider the qualifications of the Bidders, whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form. It is Owner's intent to accept alternates (if any are accepted) in the order in which they are listed in the Bid Form, but Owner may accept them in any order or combination.
- 13.3** Owner may consider the qualifications and experience of Subcontractors, Suppliers, and other persons and organizations proposed for those portions of Providing Services as to which the identity of Subcontractors, Suppliers, and other persons and organizations must be submitted as provided in the Supplementary Conditions. Owner also may consider the operating costs, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed for incorporation in Providing Services when such data is required to be submitted prior to the Notice to Proceed.
- 13.4** Owner may conduct such investigations as Owner deems necessary to assist in the evaluation of any Bid and establish the responsibility, qualifications, and financial ability of Bidders, Proposed Subcontractors, Suppliers, and other persons and organizations to perform and furnish the Required Services in accordance with the Contract Documents to Owner's satisfaction.
- 13.5** If the Contract is to be awarded, it will be awarded to the lowest responsible bidder whose evaluation by Owner indicates to Owner that the award will be in the best interest of the District.
- 13.6** If the contract is to be awarded, Owner will give the Successful Bidder a Notice of Award as soon as possible after the next meeting of the Board of Trustees.

### 14. SIGNING OF AGREEMENT

When Owner gives a Notice of Award to the Successful Bidder, it will be accompanied by two unsigned counterparts of the Agreement and all other written Contract Documents attached. Within fifteen days thereafter, Supplier shall sign and deliver two counterparts of the Agreement and attached documents to Owner with any required bonds. Within ten days thereafter, Owner shall deliver one fully signed counterpart to Supplier.

### 15. LICENSE REQUIREMENTS

All Bidders must meet the requirements of the Utah State Business License Law, and any other legal requirements to Provide Services specified in Contract Documents.



## INSTRUCTIONS TO BIDDERS

### 16. NOTICE TO PROCEED

The District intends to award the contract at the Board of Trustees next meeting following the Bid Opening and issue a Notice of Award as soon as possible thereafter. After signed Agreements along with any required bonds and insurance certificates have been submitted to Owner a notice to Proceed will be issued.



## **BID FORMS AND BIDDER'S PROPOSAL**

**Providing: ELECTRICAL BREAKER AND PROTECTIVE RELAY TESTING**

**THIS BID IS SUBMITTED TO:**

NORTH DAVIS SEWER DISTRICT  
4252 West 2200 South  
Syracuse, Utah 84075

**Bid opening will be conducted at the office of:**

NORTH DAVIS SEWER DISTRICT  
4252 West 2200 South  
Syracuse, Utah 84075  
June 30<sup>th</sup>, 2026 at 12:00 pm

1. The undersigned BIDDER proposes and agrees, if the bid is accepted, to enter into an Agreement with OWNER in the form included in the Contract Documents to perform and furnish all Services (which includes providing services and etc.) as specified or indicated in the Contract Documents for the Contract Price during the Contract term indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.
2. BIDDER accepts all of the terms and conditions of the Advertisement for Bids and Instructions to Bidders. This Bid will remain open for sixty (60) days after the day of Bid opening. BIDDER will sign the Agreement and submit other documents required by the Contract Documents with fifteen days after the date of OWNER'S Notice of Award.
3. In submitting this Bid, BIDDER represents, as more fully set forth in the Agreement, that:
  - A. BIDDER has examined copies of all the Contract Documents and of the following addenda (receipt of all which is hereby acknowledged):

Date: _____	Number: _____
Date: _____	Number: _____
Date: _____	Number: _____

Also copies of the Advertisement for Bids and the Instruction to Bidders.





## BID FORMS AND BIDDER'S PROPOSAL

7. The terms used in this Bid which are defined in the General Conditions and included as part of the Agreement, have the meanings assigned to them in the General Conditions.
8. Quantities, if used, are approximate and are for comparison of bids only. Payment will be based upon actual services furnished, in accordance with the Contract Documents. The OWNER reserves the right to add or take away Services Required as it deems necessary.
9. By submitting a Bid, BIDDER agrees to waive any claim it has or may have against the OWNER and its employees, arising out of or in connection with the administration, evaluation or recommendation of any bid.



## BID FORM

The bid for the electrical breaker and protective relay testing as per technical specs:

**TOTAL BID PRICE: \$**

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(TOTAL BID PRICE WRITTEN)



**BID FORMS AND BIDDER'S PROPOSAL**

**10. OWNER'S RIGHTS RESERVED:** The undersigned understands that the Owner reserves the right to reject any or all bids or to waive any irregularity or technicality in any Bid in the interest of the Owner.

**11. SUBMITTED on** \_\_\_\_\_, 20\_\_\_\_\_

**IF BIDDER IS:**

**An Individual**

By: \_\_\_\_\_ (SEAL)  
(Print or Type Individual's Name Under Signature)

\_\_\_\_\_

Doing Business As: \_\_\_\_\_

Business Address: \_\_\_\_\_

Phone Number: \_\_\_\_\_ Fax Number: \_\_\_\_\_

**A Partnership**

By: \_\_\_\_\_ (SEAL)  
(Print or Type General Partner's Name Under Signature)

\_\_\_\_\_

Doing Business As: \_\_\_\_\_

Business Address: \_\_\_\_\_

Phone Number: \_\_\_\_\_ Fax Number: \_\_\_\_\_



**BID FORMS AND BIDDER'S PROPOSAL**

**A Corporation**

By: \_\_\_\_\_  
(Corporation Name)

\_\_\_\_\_  
(State of Incorporation)

By: \_\_\_\_\_  
(Title)

\_\_\_\_\_  
(Print or type name of person authorized to sign)

(Corporate Seal)  
Attest: \_\_\_\_\_  
(Secretary)

Business Address: \_\_\_\_\_

Phone Number: \_\_\_\_\_ Fax Number: \_\_\_\_\_



**BID FORMS AND BIDDER'S PROPOSAL**

**A Joint Venture**

By: \_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Print Name & Title)

By: \_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Print Name & Title)

Business Address: \_\_\_\_\_

Phone Number: \_\_\_\_\_ Fax Number: \_\_\_\_\_

(Each Joint Venture must sign. The manner of signing for each individual, Partnership, and Corporation that is a party to the Joint Venture should be in the manner indicated above.)



**BID FORMS AND BIDDER'S PROPOSAL**

**A Limited Liability Company**

By: \_\_\_\_\_  
(Print or Type Manager's Name Under Signature)

\_\_\_\_\_

Doing Business As: \_\_\_\_\_

Business Address: \_\_\_\_\_

Phone Number: \_\_\_\_\_ Fax Number: \_\_\_\_\_



# **Contract Forms**

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## AGREEMENT

THIS AGREEMENT is entered into as of the 30 day of June in the year 2026 by and between NORTH DAVIS SEWER DISTRICT (hereinafter called OWNER) and \_\_\_\_\_ (hereinafter called SUPPLIER).

OWNER and SUPPLIER, in consideration of the mutual covenants hereinafter set forth, agree as follows:

### Article 1. WORK

SUPPLIER shall provide all services as specified or indicated in the Contract Documents. The service(s) required is/are generally described as follows: furnish all material, labor, tools, and equipment for:

ELECTRICAL BREAKER AND PROTECTIVE RELAY TESTING

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### Article 2. CONTRACT TERM

- 2.1 The term of the Contract shall be for a period of 180 days after the commencement date stated in the notice to proceed.

### Article 3. CONTRACT PRICE

OWNER shall pay SUPPLIER for providing construction of grit chamber concrete walls in accordance with the Contract Documents in current funds based on the prices bid according to the SUPPLIER'S Bid Price for the actual services provided. The Contract price will be a total contract of \$\_\_\_\_\_.

### Article 4. PAYMENT PROCEDURE

SUPPLIER shall submit to OWNER invoice for payment of services provided at the completion of the project.



**Article 5. SUPPLIER'S REPRESENTATIONS**

In order to induce OWNER to enter into this Agreement, SUPPLIER makes the following representations:

- 5.1** SUPPLIER has familiarized itself with the nature and extent of the Contract Documents, site, locality, and all local conditions and Laws and Regulations (Federal, State and local laws, ordinances, rules and regulations) that in any manner may affect cost, or performance of the services specified in the Contract Documents.
- 5.2** SUPPLIER has given OWNER written notice of all conflicts, errors or discrepancies that it has discovered in the Contract Documents, and the written resolution thereof by OWNER is acceptable to SUPPLIER.

**Article 6. CONTRACT DOCUMENTS**

The Contract Documents which comprise the entire Agreement between OWNER and SUPPLIER concerning Service(s) required consist of the following:

- 6.1** This Agreement
- 6.2** Notice of Award
- 6.3** Notice to Proceed
- 6.4** General Conditions
- 6.5** Supplementary General Conditions (if any)
- 6.6** Technical Specifications
- 6.7** Addenda (if any)
- 6.8** SUPPLIER'S Bid Form and Bidder's Proposal
- 6.9** Advertisement for Bids
- 6.10** Instructions to Bidders
- 6.11** The following, which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto: All written Amendments and other documents amending, modifying, or supplementing the Contract Documents. There are no Contract Documents other than those listed above in this Article 6. The Contract Documents may only be amended, modified or supplemented as provided in the General Conditions.



## AGREEMENT

### Article 7. MISCELLANEOUS

- 7.1 Terms used in this Agreement which are defined in the General Conditions will have the meanings indicated in the General Conditions.
- 7.2 No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically, but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.
- 7.3 OWNER and SUPPLIER each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreements, and obligations contained in the Contract Documents.

### Article 8. OTHER PROVISIONS

**NONE.**

IN WITNESS WHEREOF, OWNER and SUPPLIER have signed this Agreement in two counterparts. One counterpart each has been delivered to OWNER and SUPPLIER. All portions of the Contract Documents have been signed or identified by OWNER and SUPPLIER.





## NOTICE OF AWARD

Date: June 30, 2026

TO:

ADDRESS:

SERVICE(S): ELECTRICAL BREAKER AND PROTECTIVE RELAY TESTING

CONTRACT FOR: NORTH DAVIS SEWER DISTRICT

You are notified that your Bid dated: **TBD**, 2026 for the above Service(s) has been considered. You are the apparent Successful Bidder and have been awarded a Contract for the Service(s) to be provided.

The Total Contract Price of your Contract is **\$TBD**.

Two copies of each of the proposed Contract Documents accompany this Notice of Award.

You must comply with the following conditions precedent within fifteen days of the date of this Notice of Award, that is by **TBD**, 2026

1. You must deliver to the OWNER two fully executed counterparts of the Agreement including all the Contract Documents.
2. You must deliver with the executed Agreement, other documents as specified in the Instruction to Bidders, General Conditions, and Supplementary Conditions.

Failure to comply with these conditions within the time specified will entitle OWNER to consider your bid in default and to annul this Notice of Award.

Within ten days after you comply with the above conditions, OWNER will return to you one fully signed counterpart of the Agreement with the Contract Documents attached.



**NOTICE OF AWARD**

NORTH DAVIS SEWER DISTRICT

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(Authorized Signature)

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District Manager

(Title)

ACCEPTANCE OF AWARD

---

(Supplier)

---

(Authorized Signature)

---

(Title)



**NOTICE TO PROCEED**

Date: \_\_\_\_\_, 20 \_\_\_\_\_

TO:

ADDRESS:

SERVICE(S): ELECTRICAL BREAKER AND PROTECTIVE RELAY TESTING

CONTRACT FOR: NORTH DAVIS SEWER DISTRICT (Owner)

You are notified that the providing of Service(s) under the above Contract is to begin on or before \_\_\_\_\_, 20 \_\_\_\_\_. By that date, you are to start performing your obligations under the Contract Documents. In accordance with the Agreement the end of the Contract Term is therefore \_\_\_\_\_, 20 \_\_\_\_\_.

NORTH DAVIS SEWER DISTRICT

\_\_\_\_\_  
(Authorized Signature)

\_\_\_\_\_  
(Title)

\_\_\_\_\_  
(Date)



**ACCEPTANCE OF NOTICE TO PROCEED**

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(Supplier)

---

(Authorized Signature)

---

(Title)

---

(Date)



# **Conditions of the Contract**

## GENERAL CONDITIONS

- (a) “Supplier” means the person or other entity submitting bid to the District to provide services specified in the Contract Documents.
- (b) “Contract” means the contract entered into between the District and the Supplier. It includes the forms of Bid, and Other Statements of Bidders, these General Conditions of the Contract for providing services and any special conditions included elsewhere in the Contract or the specifications. It includes all formal changes to any of those documents by addendum, change order, or other modification changes.
- (c) “Contracting Officer” means the person delegated the authority by the District to enter into, administer, and/or terminate this contract and designated as such in writing to the Supplier. The term includes any successor Contracting Officer and any duly authorized representative of the Contracting Officer also designated in writing. The Contracting Officer shall be deemed the authorized agent of the District in all dealings with the Supplier.
- (d) “District” means North Davis Sewer District.
- (e) “Services” means the entire services required and specified in whole or part under this Contract.
- (f) “Specifications” means the written description of the technical requirements for providing services and includes the criteria and verifications for determining whether the requirements are met.

### **2. Supplier’s Responsibility for Providing Services**

- (a) The Supplier shall furnish all necessary labor, materials, tools, equipment, and transportation necessary for providing services specified in the Contract Documents.
- (b) At all times during performance of this contract and until the term of this contract has expired, the Supplier shall directly superintend the services provided or assigned and have onsite a competent superintendent who is satisfactory to the Contracting Officer and has authority to act for the Supplier.
- (c) The Supplier shall be responsible for all damages to persons or property that occur as a result of the Supplier’s fault or negligence, and shall take proper safety and health precautions to protect the work, the workers, the public, and the property of others. The Supplier shall hold and save the District, its officers and agents, free and harmless from liability of any nature occasioned by the Supplier’s performance. The Supplier shall also be responsible for all material used and services provided during the term of this contract.



## GENERAL CONDITIONS

- (d) The Supplier shall confine all operations (including storage of materials) on District premises to areas authorized or approved by the Contracting Officer.
- (e) The Supplier shall at all times keep the work area, including storage areas, free from accumulations of waste materials and maintain clean, neat and orderly conditions satisfactory to the Contracting Officer.

### 3. Site Investigation and Conditions Affecting the Work

- (a) The Supplier acknowledges that it has taken steps reasonably necessary to ascertain the nature and locations of the areas where specified services will be provided, and that it has investigated and satisfied itself as to the general and local conditions which can affect the providing of service or its cost, including but not limited to, (1) conditions bearing upon transportation, disposal, handling, and storage of materials; (2) the availability of labor, water, electric power, and roads; (3) uncertainties of weather or physical conditions at the site; (4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during process of providing services.
- (b) The District assumes no responsibility for any conclusions or interpretations made by the Supplier based on the information made available by the District. Nor does the District assume responsibility for any understanding reached or representation made concerning conditions which can affect providing the specified services by any of its officers or agents before the execution of this contract, unless that understanding or representation is expressly stated in this Contract.

### 4. Material and Workmanship

- (a) All equipment, material, and articles furnished under this contract shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided in this contract. Reference in the contract to equipment, materials, articles, or patented processes by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition. The Supplier, at its option, may use any equipment, materials, article, or process that, in the judgment of, and as approved by the Contracting Officer, is equal to that named in the specifications, unless otherwise specifically provided in the contract.



## GENERAL CONDITIONS

### (b) Approval of equipment and materials.

- (1) The Supplier shall obtain the Contracting Officer's approval of the machinery and mechanical and other equipment to be incorporated into the work. When requesting approval, the Supplier shall furnish to the Contracting Officer the name of the manufacturer, the model number, and other information concerning the performance, capacity, nature and rating of the machinery and mechanical and other equipment. Before installing the work, the Supplier shall obtain the approval of the Contracting Officer. When required by this contract or by the Contracting Officer, the Supplier shall also obtain the Contracting Officer's approval of the material or articles which the Supplier contemplates incorporating into the work. When requesting approval, the Supplier shall provide full information concerning the material or articles. Machinery, equipment, material, and articles that do not have the required approval shall be installed or used at the risk of subsequent rejection.
- (2) When required by the specifications or the Contracting Officer, the Supplier shall submit appropriately marked samples (and certificates related to them) for approval at the Suppliers expense, with all shipping charges prepaid. The Supplier shall label, or otherwise properly mark on the container, the material or product represented, its place of origin, the name of the producer, the Supplier's name, and the identification of the project for which the material or product is intended to be used.

## 5. Permit and Codes

- (a) The Supplier shall give all notices and comply with all applicable laws, ordinances, codes, rules and regulations. Notwithstanding the requirement of the Supplier to comply with the specifications in the contract, all services provided shall comply with all applicable codes and regulations as amended by any government agency. The Supplier shall examine the specifications for compliance with applicable codes and regulations bearing on providing the services and shall immediately report any discrepancy it may discover to the Contracting Officer. Where the requirements of the specifications fail to comply with the applicable codes or regulations, the Contracting Officer shall modify the contract by change order pursuant to the clause entitled, "Changes herein to conform to the code or regulations."



## GENERAL CONDITIONS

- (b) The Supplier shall secure and pay for all permits, fees, and licenses necessary for the proper performance of service specified.

### 6. Health, Safety, and Accident Prevention

- (a) In performing the contract, the Supplier shall:

- (1) Ensure that no laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his/her health and/or safety as determined under construction safety and health standards promulgated by any governmental agency;
- (2) Protect the lives, health, and safety of other persons;
- (3) Prevent damage to property, material, supplies, and equipment; and,
- (4) Avoid interruptions to performance of service.

- (b) For these purposes, the Contractor shall:

- (1) Comply with regulations and standards issued by the Secretary of Labor at 29 CFR part 1926. Failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standard Act (Public Law 91-54, 83 Stat, 96), 40 U.S.C. 3701 et seq.
- (c) The Supplier shall maintain an accurate record of exposure data on all accidents incident to services performed under this contract resulting in death, traumatic injury, occupational disease, or damage to property, material, supplies, or equipment, and shall report this data in the manner prescribed by 29 CFR Para 904.
- (d) The Contracting Officer shall notify the Supplier of any noncompliance with these requirements and of the corrective action required. This notice, when delivered to the Supplier or the Supplier's representative at the site of the services, shall be deemed sufficient notice of the noncompliance and corrective action required; after receiving the notice, the Supplier shall immediately take corrective action. If the Supplier fails or refuses to take corrective action promptly, the Contracting Officer may issue an order stopping all or part of the services work until satisfactory corrective action has been taken. The Supplier shall not base any claim or request for equitable adjustment for additional time or money on any stop order issued under these circumstances.



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- (e) The Supplier shall be responsible for its subcontractor's compliance with the provision of this clause. The Supplier shall take such action with respect to any subcontractors as the District, as a means of enforcing such provisions.

### 7. Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements

- (a) The Supplier shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the sites where services are provided and which do not unreasonably interfere with the performance of services required under this contract.
- (b) The Supplier shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during performance of this contract, or by the careless operation of equipment, or by workmen, the Supplier shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.
- (c) The Supplier shall protect from damage all existing improvements and utilities (1) at or near the site where service are performed and (2) on adjacent property of a third party, the locations of which are made known to or should be known by the Supplier.
- (d) The Supplier shall repair any damages to vegetation, structures, equipment, utilities, or improvements, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing them. If the Supplier fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Supplier.

### 8. Inspection and Acceptance of Services Performed

- (a) Definitions. As Used in this clause.
  - (1) "Acceptance" means the act of an authorized representative of the District by which the District approves the services performed under this contract. Acceptance may be partial or complete.
  - (2) "Inspection" means examining and testing the services performed under the contract to determine whether services conform to contract requirements.
- (b) The Owner or Owner's representative may at any time conduct an inspection to determine and verify that the services being provided by the SUPPLIER are in conformance with the contract document requirements and specifications.



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- (c) The Supplier shall, without charge, replace or correct services found by the District not to conform to contract requirements.

### 9. Prohibition against Liens

The Supplier is prohibited from placing a lien on the District's property. This prohibition shall apply to all subcontractors at any tier and all material suppliers.

### 10. Order of Provisions

In the event of a conflict between these General Conditions and the Specifications, the General Conditions shall prevail. In the event of a conflict between the Contract and any applicable state or local law or regulation, the state or local law or regulation shall prevail; provided that such state or local law or regulation does not conflict with, or is less restrictive than applicable federal law, regulations, or Executive order. In the event of such a conflict, applicable federal law, regulations and Executive Order shall prevail. In the event of a conflict between these General Conditions and the Contract, the terms of the Contract shall prevail.

### 11. Payments

- (a) The District shall pay the Supplier the price bid at the completion of the project.

### 12. Contract Modifications

- (a) Only the Contracting Officer has authority to modify any term or conditions of this contract. Any contract modification shall be authorized in writing.
- (b) The Contracting Officer may modify the contract unilaterally (1) pursuant to a specific authorization stated in a contract clause (e.g. Changes); or (2) for administrative matters which do not change the rights or responsibility of the parties (e.g. change in the District address). All other contract modifications shall be in the form of supplemental agreements signed by the Supplier and the Contracting Officer.

### 13. Suspension of Services

- (a) The Contracting Officer may order the Supplier in writing to suspend, delay, or interrupt all or any part of the service provided of this contract for the period of time that the Contracting Officer determines appropriate for the convenience of the District.



## GENERAL CONDITIONS

- (b) If the performance of all or any part of providing services is, for an unreasonable period of time, suspended, delayed, or interrupted (1) by an act of the Contracting Officer in the administration of this contract, or (2) by the Contracting Officer's failure to act within the time specified (or within a reasonable time if not specified in this contract) an adjustment shall be made for any increases in the cost of performance of the services (excluding profit) necessarily caused by such unreasonable suspension, delay, or interruption and the contract modified in writing accordingly. However, no adjustment shall be made under this clause for any suspension, delay or interruption to the extent that performance would have been so suspended, delayed or interrupted by any other cause, including the fault or negligence of the Suppliers for which any equitable adjustment is provided for or excluded under any other provision of this contract.
- (c) A claim under this clause shall not be allowed (1) for any costs incurred more than 20 days before the Supplier shall have notified the Contracting Officer in writing of the act or failure to act involved (but this requirement shall not apply as to a claim resulting from a suspension order); and, (2) unless the claim, in an amount stated, is asserted in writing as soon as practicable after termination of the suspension, delay, or interruption.

### 14. Disputes

- (a) "Claim" as used in this clause, means a written demand or written assertion by one of the contracting parties seeking, as matter of right, the payment of money in a sum certain, the adjustment or interpretation of contract terms, or other relief arising under or relating to the contract. A claim arising under the contract, unlike a claim relating to the contract, is a claim that can be resolved under a contract clause that provides for the relief sought by the claimant. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim. The submission may be converted to a claim by complying with the requirements of this clause, if it is disputed either as to liability or amount or is not acted upon in a reasonable time.
- (b) All disputes arising under or relating to this contract, including any claims for damages for the alleged break thereof which are not disposed of by agreement, shall be resolved under this clause.
- (c) All claims by the Supplier shall be made in writing and submitted to the Contracting Officer for a written decision. A claim by the District against the Supplier shall be subject to a written decision by the Contracting Officer.



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- (d) The Contracting Officer shall, within 60 (unless otherwise indicated) days after receipt of the request, decide the claim or notify the Supplier of the date by which the decision will be made.
- (e) The Contracting Officer's decision shall be final unless the Supplier (1) appeals in writing to the Board of Trustees, (2) refers the appeal to an independent mediator or arbitrator, or (3) files suit in a court of competent jurisdiction. Such appeal must be made within thirty (30) days unless otherwise indicated after receipt of the Contracting Officer's decision.
- (f) The Supplier shall proceed diligently with performance of this Contract, pending final resolution of any request of relief, claim, appeal, or action arising under or relating to the contract, and comply with any decision of the Contracting Officer.

### 15. Termination of Convenience

- (a) The Contracting Officer may terminate this contract as a whole, or in part, whenever the Contracting Officer determines that such termination is in the best interest of the District. Any such Termination shall be affected by delivery to the Supplier of a Notice of Termination specifying the extent to which the performance of Services under the contract is terminated, and the date upon which such termination becomes effective.
- (b) If the performance of Services are terminated, either in whole or in part, the District shall be liable to the Contractor for reasonable and proper costs resulting from such termination upon the receipt by the District of a properly presented claim setting out in detail: (1) the total cost of the services performed to date of termination less the total amount of payments made to the Supplier.
- (c) The Contracting Officer will act on the Suppliers claim within days (60 days unless otherwise indicated) of receipt of the Supplier's claim.
- (d) Any disputes regarding this clause are expressly made subject to the provisions of the Disputes clause of this Contract.

### 16. Assignment of Contract

The Supplier shall not assign or transfer any interest in this contract except that claims for monies due or to become due from the District under the contract may be assigned to a bank, trust company, or other financial intuition. Such assignment of claims shall only be made with the written concurrence of the Contracting Officer. If the Supplier is a



## GENERAL CONDITIONS

partnership, this contract shall ensure the benefit of the surviving or remaining member(s) of such partnership as approved by the Contracting Officer.

### 17. Insurance

- (a) Before providing any Services the Supplier and each Subcontractor shall furnish the District with certificates of insurance showing the following insurance is in force and will insure all operations under Contract:
- (1) Workers' Compensation, in accordance with State of Utah Compensation laws.
  - (2) Commercial General Liability with a combined single limit for bodily injury and property damage of not less than \$1,000,000.00 per occurrence to protect the Contractor and each Subcontractor against claims for bodily injury or death and damage to the property of others. This shall cover the use of all equipment, hoists, and vehicles on the site(s) not covered by Automobile Liability. The District shall be listed as a named insured on all such policies.
  - (3) Automobile Liability on owned and non-owned motor vehicles used on the site(s) or in connection therewith for a combined single limit for bodily injury and property damage of not less than \$1,000,000.00 per occurrence.
  - (4) All insurance shall be carried with companies which are financially responsible and permitted to do business in the State of Utah. If any such insurance is due to expire during term of the contract, the Supplier (including subcontractors, as applicable) shall not permit the coverage to lapse and shall furnish evidence of coverage to the Contracting Officer. All certificates of insurance, as evidence of coverage, shall provide that no coverage may be canceled or non-renewed by the insurance company until at least 30 days prior written notice has been given to the Contracting Officer.

### 18. Subcontractor

- (a) Definitions. As used in this Contract.
- (1) "Subcontract" means any contract, purchase order, or other purchase agreement, including modifications and change orders to the foregoing, entered into by a subcontractor to furnish supplies, materials, equipment, and services for the performance of the prime contractor a subcontract.



## GENERAL CONDITIONS

- (2) “Subcontractor” means any supplier, vendor, or firm that furnishes supplies, material, equipment, or services to or for the Contractor or another Subcontractor.
- (b) The Supplier shall be a fully responsible for the acts or omissions of its subcontractors and of people either directly or indirectly employed by them as for the acts or omissions of persons directly employed by the Supplier.
- (c) The Supplier shall insert appropriate clauses in all Subcontracts to bind Subcontractors to the terms and conditions of this contract insofar as they are applicable to work of Subcontractors.

### **19. Equal Employment Opportunity**

During the performance of this contract, the Supplier agrees as follow:

- (a) The Supplier shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, or handicap.
- (b) The Supplier shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, national origin, or handicap.

### **20. Interest of Members, Officers, or Employees and Former Members, Officers, or Employees**

No member, officer, or employee of the District, no member of the governing body of the locality in which the project is situated, no member of the governing body of the locality in which the District was activated, and no other public official of such locality or localities who exercise any functions or responsibilities with respect to the project, shall, during his or her tenure, or for one year thereafter, have any interest, direct or indirect, in this contract or the proceeds thereof.

### **21. Examination and Retention of Supplier’s Records**

- (a) The District shall, until three (3) years after final payment under this contract, have access to and the right to examine any of the Supplier’s directly pertinent books, documents, papers, or other records involving transactions related to this contract for the purpose of making audits, examinations, excerpts, and transcriptions.



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- (b) The Supplier agrees to include in first-tier subcontracts under this contract a clause substantially the same as paragraph (a) above. "Subcontract," as used in this clause, excludes purchase orders not exceeding \$10,000.
  
- (c) The periods of access and examination in paragraph (a) and (b) above for records relating to (1) appeals under the Disputes clause of this contract, (2) litigation or settlement of claims arising from the performance of this contract, or (3) costs and expenses of this contract to which the District has taken exception shall continue until disposition of such appeals, litigations, claims, or exceptions.



# **Technical Specifications**

## TECHNICAL SPECIFICATIONS

### ELECTRICAL BREAKER AND PROTECTIVE RELAY TESTING

#### SECTION 1 TEST, CLEAN, AND INSPECT ALL BREAKERS AND PROTECTIVE RELAYS AS ITEMIZED IN “ATTACHMENT A”:

- 1.1 At the completion of all testing, provide a written list of all findings with a recommended corrective action for each occurrence.
- 1.2 All testing requirements must be conducted while maintaining the treatment facilities discharge permit. NDS electrical staff will guide contractor through special requirements to maintain treatment plant permit compliance at all times. It is preferred to test breakers in their installed cabinets when testing will have no adverse effect on downstream equipment.
- 1.3 At the completion of the project the contractor shall submit a single invoice for the services defined in the technical specifications along with the written list of findings and recommendations.
- 1.4 Contractor must show proof of at least one on-site technician’s NETA Certification, references of at least two facilities that have contracted with contractors for similar testing within the last two years. At no time can any breakers be tested without the NETA certified technician present. The NETA technician must be an employee of the contractor, and no sub-contractors will be allowed. Contractors who are familiar with the treatment plant and have performed similar work at the facility, may be given preferential treatment in the bidding process. Contractor’s technicians must follow Arc Flash protection requirements, and attend a mandatory 30 minute safety orientation conducted by the District’s safety specialist.

#### SECTION 2 PROCEDURES AS PER 2013 ANSI/NETA STANDARDS:

- 2.1 Medium Voltage Vacuum Circuit Breakers and Protective Relays
  - 2.1.1 Visual and Mechanical Inspection
    - a. Inspect physical and mechanical condition.
    - b. Inspect anchorage, alignment, and grounding.
    - c. Verify that all maintenance devices are available for servicing and operating the breaker.



## TECHNICAL SPECIFICATIONS

- d. Clean the unit.
- e. Inspect vacuum bottle assemblies.
- f. Measure critical distances such as contact gap as recommended by the manufacturer.
- g. If recommended by the manufacturer, slow close/open the breaker and check for binding, friction, contact alignment, contact sequence, and penetration.
- h. Perform all mechanical operation tests on the operating mechanism in accordance with manufacturer's published data.
- i. Inspect bolted electrical connections for high resistance using one of the following methods:
  - Use of a low-resistance ohmmeter in accordance with Section 7.6.3.2.2.
  - Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.12.
- j. Verify cell fit and element alignment.
- k. Verify racking mechanism operation.
  - 2. Inspect vacuum bellows operation.
- a. Use appropriate lubrication on moving current-carrying parts and on moving and sliding surfaces.
- b. Record as-found and as-left operation counter readings.

### 2.1.2 Electrical Tests

- a. Perform resistance measurements through bolted connections with a low-resistance ohmmeter, if applicable, in accordance with Section 7.6.3.1.10.
- b. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with circuit breaker closed and across each pole with the breaker open. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1.
- c. Perform a contact/pole-resistance test.
- d. With breaker in a test position, perform the following tests:
  - 1. Trip and close breaker with the control switch.
  - 2. Trip breaker by operating each of its protective relays.
  - 3. Verify mechanism charge, trip-free, and anti-pump functions.



## TECHNICAL SPECIFICATIONS

4. Perform a vacuum bottle integrity (overpotential) test across each vacuum bottle with the breaker in the open position in strict accordance with manufacturer's published data. Do not exceed maximum voltage stipulated for this test. Provide adequate barriers and protection against x radiation during this test. Do not perform this test unless the contact displacement of each interrupter is within manufacturer's tolerance. (Be aware that some dc high-potential test sets are half wave rectified and may produce peak voltages in excess of the breaker manufacturer's recommended maximum.)
5. Verify operation heaters, if applicable.

### 2.1.3 Test Values

#### a. Test Values – Visual and Mechanical

- Mechanical operation and contact alignment should be in accordance with manufacturer's published data.
- Compare bolted connection resistance values to values of similar connections. Investigate values which deviate from those of similar bolted connections by more than 50 percent of the lowest value.
- Bolt-torque levels should be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.12.
- Compare travel and velocity values to manufacturer's published data and previous test data.

#### b. Test Values – Electrical

- Compare bolted connection resistance values to values of similar connections. Investigate values which deviate from those of similar bolted connections by more than 50 percent of the lowest value.
- Insulation-resistance values of circuit breakers should be in accordance with manufacturer's published data. In the absence of manufacturer's data, use Table 100.1. Values of insulation resistance less than this table or manufacturer's recommendations should be investigated.



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- Insulation-resistance values of control wiring should be comparable to previously obtained results but not less than two megohms.
- Micro-ohm or dc millivolt drop values shall not exceed the high levels of the normal range as indicated in the manufacturer's published data. If manufacturer's published data is not available, investigate values that deviate from adjacent poles or similar breakers by more than 50 percent of the lowest value.
- Breaker mechanism charge, close, open, trip, trip-free, and anti-pump features shall function as designed.
- Minimum pickup for trip and close coils shall be in accordance with manufacturer's published data. In the absence of manufacturer's data, refer to Table 100.20.
- Power-factor or dissipation-factor values shall be compared to manufacturer's published data. In the absence of manufacturer's published data, the comparison shall be made to similar breakers.
- Power-factor or dissipation-factor and capacitance values should be within ten percent of nameplate rating for bushings. Hot collar tests are evaluated on a milliampere/milliwatt loss basis, and the results should be compared to values of similar bushings.
- If no evidence of distress or insulation failure is observed by the end of the total time of voltage application during the vacuum bottle integrity test, the test specimen is considered to have passed the test.  
If no evidence of distress or insulation failure is observed by the end of the total time of voltage application during the overpotential test, the test specimen is considered to have passed the test.
- Heaters should be operational.

### 2.2 Low Voltage Power Circuit Breakers

#### 2.2.1 Visual and Mechanical Inspections

- a. Inspect physical and mechanical condition.
- b. Inspect anchorage, alignment, and grounding.



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- c. Verify that all maintenance devices are available for servicing and operating the breaker.
- d. Clean the unit.
- e. Inspect arc chutes.
- f. Inspect moving and stationary contacts for condition, wear, and alignment.
- g. Verify that primary and secondary contact wipe and other dimensions vital to satisfactory operation of the breaker are correct.
- h. Perform all mechanical operator and contact alignment tests on both the breaker and its operating mechanism in accordance with manufacturer's published data.
- i. Inspect bolted electrical connections for high resistance using one of the following methods:
  - Use of a low-resistance ohmmeter in accordance with Section 7.6.1.2.2.
  - Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or Table 100.12.
- j. Verify cell fit and element alignment.
- k. Verify racking mechanism operation.
- l. Use appropriate lubrication on moving current-carrying parts and on moving and sliding surfaces.
- m. Perform adjustments for final protective device settings in accordance with coordination study provided by end user.
- n. Record as-found and as-left operation counter readings, if applicable.

### 2.2.2 Electrical Tests

- a. Perform resistance measurements through bolted connections with a low-resistance ohmmeter, if applicable, in accordance with Section 7.6.1.2.1.
- b. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with the circuit breaker closed, and across each open pole. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1.
- c. Perform a contact/pole-resistance test.
- d. Determine long-time pickup and delay by primary current injection.



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- e. Determine short-time pickup and delay by primary current injection.
- f. Determine ground-fault pickup and delay by primary current injection.
- g. Determine instantaneous pickup current by primary current injection.
- h. Perform minimum pickup voltage test on shunt trip and close coils in accordance with Table 100.20.
- i. Verify correct operation of auxiliary features such as trip and pickup indicators, zone interlocking, electrical close and trip operation, trip-free, anti-pump function, and trip unit battery condition. Reset all trip logs and indicators.
- j. Verify operation of charging mechanism.

### 2.2.3 Test Values

#### a. Test Values – Visual and Mechanical

- Compare bolted connection resistance values to values of similar connections. Investigate values which deviate from those of similar bolted connections by more than 50 percent of the lower value.
- Bolt-torque levels should be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.12.
- Settings shall comply with coordination study recommendations.

#### b. Test Values – Electrical

- Compare bolted connection resistance values to values of similar connections. Investigate values which deviate from those of similar bolted connections by more than 50 percent of the lowest value.
- Insulation-resistance values of breakers should be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1. Values of insulation resistance less than this table or manufacturer's recommendations should be investigated.
- Micro-ohm or dc millivolt drop values should not exceed the high levels of the normal range as indicated in the



## TECHNICAL SPECIFICATIONS

manufacturer's published data. If manufacturer's data is not available, investigate values that deviate from adjacent poles or similar breakers by more than 50 percent of the lowest value.

- Insulation-resistance values of control wiring should be comparable to previously obtained results but not less than two megohms.
- Long-time pickup values should be as specified, and the trip characteristic shall not exceed manufacturer's published time current characteristic tolerance band, including adjustment factors. If manufacturer's curves are not available, trip times shall not exceed the value shown in Table 100.7. (Circuit breakers exceeding specified trip time shall be tagged defective.)
- Short-time pickup values should be specified, and the trip characteristic should not exceed manufacturer's published time-current tolerance band. (Circuit breakers exceeding specified trip time shall be tagged defective.)
- Ground fault pickup values should be as specified, and the trip characteristic should not exceed manufacturer's published time-current tolerance band. (Circuit breakers exceeding specified trip time shall be tagged defective.)
- Instantaneous pickup values should be within the tolerances of manufacturer's published data. In the absence of manufacturer's published data, refer to Table 100.8. (Circuit breakers exceeding specified trip time shall be tagged defective.)
- Pickup values and trip characteristics should be specified and within manufacturer's published tolerances. (Circuit breakers exceeding specified trip time shall be tagged defective.)
- Minimum pickup voltage on shunt trip and close coils should be in accordance with manufacturer's published data. In the absence of manufacturer's published data, refer to table 100.20.
- Auxiliary features should operate in accordance with manufacturers' published data.
- The charging mechanism should be in accordance with manufacturer's published data.

### 2.3 Low Voltage Insulated Case Circuit Breakers



## TECHNICAL SPECIFICATIONS

### 2.3.1 Visual and Mechanical Inspection

- a. Inspect physical and mechanical condition.
- b. Inspect anchorage and alignment.
- c. Clean the unit.
- d. Operate the circuit breaker to ensure smooth operation.
- e. Inspect bolted electrical connections for high resistance using one of the following methods:
  - Use of a low-resistance ohmmeter in accordance with Section 7.6.1.1.2.
  - Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or Table 100.12.
- f. Inspect operating mechanisms, contacts, and arc chutes in unsealed units.
- g. Perform adjustments for final protective device settings in accordance with coordination study provided by end user.

### 2.3.2 Electrical Tests

- a. Perform resistance measurements through bolted connections with a low-resistance ohmmeter, if applicable, in accordance with Section 7.6.1.1.1.
- b. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with the circuit breaker closed, and across each open pole. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1.
- c. Perform a contact/pole-resistance test.
- d. Determine long-time pickup and delay by primary current injection.
- e. Determine short-time pickup and delay by primary current injection.
- f. Determine ground-fault pickup delay by primary current injection.
- g. Determine instantaneous pickup current by primary injection.
- h. Perform minimum pickup voltage test on shunt trip and close coils in accordance with Table 100.20.
- i. Verify correct operation of auxiliary features such as trip and pickup indicators, zone interlocking, electrical close and trip



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operation, trip-free, anti-pump function, and trip unit battery condition. Reset all trip logs and indicators.

- j. Verify operation of charging mechanism.

### 3.3.3. Test Values

#### a. Test Values – Visual and Mechanical

- Compare bolted connection resistance values to values of similar connections. Investigate values which deviate from those of similar bolted connections by more than 50 percent of the lowest value.
- Bolt torque levels should be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.12.
- Settings shall comply with coordination study recommendations.

#### b. Test Values – Electrical

- Compare bolted connection resistance values to values of similar connections. Investigate values which deviate from those of similar bolted connections by more than 50 percent of the lowest value.
- Insulation resistance values should be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1. Values of insulation resistance less than this table or manufacturer's recommendations should be investigated.
- Micro-ohm or dc millivolt drop values should not exceed the high levels of the normal range as indicated in the manufacturer's published data. If manufacturer's data is not available, investigate values that deviate from adjacent poles or similar breakers by more than 50 percent of the lowest value.
- Insulation-resistance values of control wiring should be comparable to previously obtained results but not less than two megohms.
- Long-term pickup values should be specified, and the trip characteristic should not exceed manufacturer's published time current characteristic tolerance band, including adjustment factors. If manufacturers' curves are not available, trip times should not exceed the value shown in



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Table 100.7. (Circuit breakers exceeding specified trip time shall be tagged defective.)

- Short-time pickup values should be specified, and the trip characteristic should not exceed manufacturer's published time-current tolerance band. (Circuit breakers exceeding specified trip time shall be tagged defective.)
- Ground fault pickup values should be as specified, and the trip characteristic should not exceed manufacturer's published time-current tolerance band. (Circuit breakers exceeding specified trip time shall be tagged defective.)
- Instantaneous pickup values of molded-case circuit breakers should fall within manufacturer's published tolerances. In the absence of manufacturer's published tolerances, refer to Table 100.8. (Circuit breakers exceeding specified trip time shall be tagged defective.)
- Pickup values and trip characteristics should be within manufacturer's published tolerances. (Circuit breakers exceeding specified trip time shall be tagged defective.)
- Minimum pickup voltage on shunt trip and close coils should be in accordance with manufacturer's published data. In the absence of manufacturer's published data, refer to Table 100.20.
- Breaker open, close, trip, trip-free, anti-pump, and auxiliary features should function as designed.
- Charging mechanism shall function as designed.

## END OF TECHNICAL SPECIFICATIONS

