BID BOOKLET
FOR
BARTHOLOMEW BLDG. STANDBY POWER SYSTEM

Install Standby Power System

Bartholomew Bldg. Standby Power System

Morrow County, OR

December 19, 2025

CLASS OF PROJECT STATE
CLASS OF WORK ELECTRICAL
BID OF December 19, 2025

DESCRIPTION OF WORK

Install Standby Power System
Bartholomew Bldg. Standby Power System
Morrow County, OR

TIME AND PLACES OF RECEIVING BIDS (BID CLOSING)

Bid Closing for the work described above will be at 9:00:00 a.m. on the 19th day of December, 2025. Bids will be received by Sandi Pointer, Morrow County Risk and Procurement Manager.

Submit electronic bids, on-line through Bid Express® (www.bidx.com) before 9:00:00 a.m. on the day of Bid Closing.

Submit paper bids to Sandi Pointer:

Before 9:00:00 a.m. on the day of Bid Closing.

For Bids submitted by mail or parcel delivery service, send to:

Irrigon Government Center
215 NE Main Ave.
Irrigon, Oregon, 97844

For Bids submitted by hand delivery, date stamp the Bid with the provided date stamping device and place into the Procurement Bid Box located in the 1st floor lobby at the following address:

Irrigon Government Center
215 NE Main Ave.
Irrigon, Oregon, 97844

Bids, Bid modifications, and Bid withdrawals will not be accepted at or after 9:00:00 a.m. on the day of Bid Closing.

PLACE, TIME, AND DATE OF READING BIDS (BID OPENING)

Bid Opening for the work described above will be at the following address:

Irrigon Government Center
215 NE Main Ave.
Irrigon, Oregon, 97844

, beginning at 9:00:00 a.m. on the day of Bid Closing in the “Don Adams Conference Room”.

COMPLETION TIME LIMIT

See Special Provisions Subsection 00180.50(h).

CLASS OF PROJECT

This is a State Project.

CLASS OF WORK

The Class of Work for this Project is: Electrical.

APPLICABLE SPECIAL PROVISIONS

The Special Provisions booklet applicable to the above-described work, for which Bids will be opened at the place, time, and date stated above, is that which contains the exact information as shown above on this page.

Bidders are cautioned against basing their Bids on a booklet bearing any different description, date(s), Class of Project, or Class of Work.

BIDDER'S CHECKLIST
Bartholomew Bldg. Standby Power System

In order to submit a complete bid, Bidders must submit the following documents:

___Bid Form

___Bid Security

___Non-Collusion Affidavit Certification

___Project Certifications

___First-Tier Subcontractor Disclosure Form

___Bid Schedule

NOTE: Failure to submit all required bid documents will result in a bid being considered non-responsive and not considered for award. County reserves the right to reject all non-responsive bids.

PROJECT DOCUMENTS

The following project documents are for reference only and are provided to prospective bidders as related information for this solicitation process.

 Special Provisions
 Plans

BID FORM

Bartholomew Bldg. Standby Power System

BID BOND #: _____

To: Irrigon Government Center
215 NE Main Ave.
Irrigon, Oregon, 97844

Bidder Representation. The undersigned, hereinafter called Bidder, hereby certifies and represents that the Bidder:
1) has examined and is thoroughly familiar with all the Contract Documents;
2) has examined and is thoroughly familiar with the site of the proposed construction;
3) fully understands the manner in which payment will be made for the construction furnished;
4) fully understands that the estimated quantities shown in this bid, if any, are for comparison of bids only; and
5) fully understands that failure to complete or respond in some way to every required portion of the Bid Booklet will be viewed as non-compliant and disqualify the Bidder.

Addenda Acknowledgement. Bidder acknowledges receipt of the following number of addenda: _____, and agrees that all addenda issued are made part of the solicitation documents and have been considered in preparing the bid. (NOTE: insert the number of addendums received; if no addenda were issued, enter “zero,” “0” or “n/a” in the space.)

Bid Security. Bidder agrees that bid security shall form a part of this bid and has attached one of the following:
1) A surety bond duly completed by a guaranty company authorized to conduct business in the State of Oregon, in the amount equal to ten percent (10%) of the total amount of this bid. The bond must be submitted in PDF format with signatures and some form of indication the surety’s seal is affixed, and include, either on the PDF of the bond or by separate page with the bid submission, the name of the surety, phone number of the surety’s office for verification of the bond, and a bond validation number.
2) A cashier’s check or certified check made payable to Irrigon Government Center, 215 NE Main Ave., Irrigon, Oregon, 97844, from a bank in good standing in the amount equal to ten percent (10%) of the total amount of this bid. Bidder must include with bid submission a statement that the bid security was issued to the County by check prior to bid closing and that the bidder assumes all liability for ensuring the check is received by the County by bid closing. Delays due to mail and/or delivery handling, including but not limited to the County’s internal distribution systems, do not excuse the bidder’s responsibility for submitting the bid security to the correct location by the due date.

Bidder agrees, upon award of the contact for the work proposed, that if it fails or refuses to execute the contract, furnish acceptable certificates of insurance, or provide performance and payment bonds within ten (10) business days of the notice of award, then the bid security in the sum equal to ten percent (10%) of the total bid amount shall be permanently retained by County as liquidated damages, and not as any sort of a penalty to the Bidder, and it is agreed that the said sum is a fair measure of the amount of damage County will sustain for failure to execute the contract.

Returned Contract Documents. Bidder agrees upon award of the contract, the contract will be signed and delivered to County in the form of the contract annexed hereto within ten (10) business days after notice of award, and will at the time of execution of the contract deliver to County the proper certificates of insurance and Performance and Payment Bonds required by the Contract Documents.

Execution of Work. Bidder agrees upon award of this bid and execution of the contract for performance of the work, to so plan and execute the work in such a manner so that all of the work as outlined in the Contract Documents is completed within the time specified in the project Special Provisions, after issuance of the notice to proceed.

Understanding of County's Rights. Bidder understands that the County reserves the right to reject any or all bids and to determine which bid is, in the sole judgment of the County, the lowest responsive, responsible bid, and which bid, if any, should be accepted in the best interest of the County. Bidder understands that County reserves the right to waive any informality or technicality in any bid in the interest of the County.

Bidder Declarations. Bidder declares that the only person(s) or party(ies) interested in this bid are those named herein; that this bid is, in all respects, fair and without fraud; that it is made without collusion with any official representative of the County; and that the bid is made without any connection or collusion with any person making another bid for the work proposed.

Bid Prices and Quantities. Bidder proposes to perform all work as stated in the Contract Documents at the prices listed in the Bid Schedule. Bidder may wish to compute quantities to verify work necessary to complete the project as called for under the Contract Documents. The quantities provided are for the convenience of comparing bids.

Bidder Guarantee. Bidder does hereby propose to furnish all labor, material, tools, equipment and appliances necessary to construct and complete the project. And all specified work appurtenant thereto, and in connection with this project for the County within the time limit specified, and in accordance with the drawings, specifications, and contract change order documents for the sums set forth in the Bid Schedule.

Respectfully submitted this ____ day of _____, 2025.

Submitted By: _____
(Name of bidding firm or corporation)
Street Address: _____
City, State, Zip: _____
Phone: _____
Email: _____
Construction Contractors Board License No.: _____
License Classification: _____
License Expiration Date: _____
Federal ID No.: _____

(Affix Corporate Seal Here)

If Bidder is:

AN INDIVIDUAL

By: _____
(Type or print name)
Authorized Signature: _____
(Handwritten or electronic signature)
Doing business as: _____

A CORPORATION

By: _____
(Corporation's Name)
_____
(State of Incorporation)
By: _____
(Name of person authorized to sign)
_____
(Handwritten or electronic signature)
Title _____
(Owner/Partner/President/Vice President)
Attest _____
(Secretary)
_____
(Handwritten or electronic signature)
Home Office Address: _____
(If different from above)

(Affix Corporate Seal Here)

A PARTNERSHIP

By: _____
(Firm's Name)

_____
(General partner's name)

_____
(Handwritten or electronic signature)
Title: _____
(Owner/Partner/President/Vice President)

A JOINT VENTURE
Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation
that is a party to the joint venture shall be in a manner indicated above. List additional company names
and addresses below:

Submitted By: _____
(Name of bidding firm or corporation)
Street Address: _____
City, State, Zip: _____
Phone: _____
Email: _____
Construction Contractors Board License No.: _____
License Classification: _____
License Expiration Date: _____
Federal ID No.: _____
(Affix Corporate Seal Here)

BID BOND

Bartholomew Bldg. Standby Power System

BID BOND #: _____

KNOW ALL PERSONS BY THESE PRESENTS, that,

_____,

Contractor's Name

hereinafter called the Principal, and

_____,

Surety

a corporation duly organized under the laws of the State of _____, having its principal place of business at

_____

_____,

Address, City, State and Zip Code

in the State of , and authorized to do business in the State of Oregon as Surety, and held firmly bound unto Morrow County, hereinafter called Obligee, in the penal sum of _____ US dollars ($), for the payment of which, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal is submitting their Bid for the above-noted project in the City of Heppner, Oregon in Morrow County.

NOW, THEREFORE, the condition of this bond is such that if the said Bid submitted by the said Principal is accepted, and the contract be awarded to said Principal, and if the said Principal shall execute the proposed contract as required by the Contract Documents within the time set by said documents, then this obligation shall be void. If the Principal fails to execute the proposed contract, the Surety hereby agrees to pay to Obligee the penal sum as liquidated damages and not as any sort of penalty. In no event shall liability exceed the penal sum hereof.

Signed and sealed this day of , 2025.

Principal

By:

Surety

By:

Attorney-in-Fact

(A certified copy of the Agent’s Power of Attorney must be attached)

NON-COLLUSION AFFIDAVIT CERTIFICATE
Bartholomew Bldg. Standby Power System

State of

County of

The undersigned, being duly sworn, deposes and says that the person, firm, association, co-partnership, corporation herein named has not either directly or indirectly entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in the preparation and submission of a bid to the County for consideration in the award of the contract on the improvements described within the Contract Documents.

Firm's Name

Signature of Authorized Person

Printed Name & Title of Authorized Person

Sworn to before me this day of , 2025.

Notary Public

in and for the State of

residing at .
Address

PROJECT CERTIFICATIONS

Bartholomew Bldg. Standby Power System

1. Prevailing Wage Certification

I, hereby certify that, in accordance with the provisions of ORS 279C.838 and 279C.840, the hourly rate of wage to be paid to workers upon public works contracts greater than $50,000.00 shall be not less than the prevailing wage for an hour's work in the same trade or occupation in the locality where the labor is performed.

2. Public Works Bond Certification

I, hereby certify that, in accordance with the provisions of ORS 279C.830, the below-named contracting firm and any subcontractors, upon execution of the awarded contract, shall file with the Construction Contractors Board a public works bond with a corporate surety authorized to do business in the state of Oregon in the amount of $30,000.00, unless exempt under ORS 279C.836 (4), (7), (8) or (9).

3. Resident/Non-Resident Bidder

I, hereby certify that, under the provisions of ORS 279A.120, the below-named contracting firm is a resident bidder of the state of _____. County will add a percent increase to the bid amount of a non-resident bidder equal to the percent, if any, of the preference given to the bidder in the state in which the bidder resides. The increase will only be applied to determine the lowest bid, and it will not cause an increase in payment to the contractor after award of the contract.

4. Contractor's License Certification

I, hereby certify that, under the provisions of ORS 701, the below-named contracting firm is licensed with the Oregon Construction Contractors Board, license number _____.

5. Certification of Non-Discrimination

I, hereby certify that, in accordance with the provisions of ORS 279A.110 (4), the below-named contracting firm has not discriminated and will not discriminate against a subcontractor in awarding a subcontract because the subcontractor is a disadvantaged business enterprise, a minority-owned business, a woman-owned business, a business that a service-disabled veteran-owned, or an emerging small business certified under ORS 200.055.

6. Conflict of Interest

Each person signing on behalf of the bidding firm certifies, and in the case of sole proprietorship, partnership, or corporation, each party certifies as to its own organization, under penalty of perjury, that to the best of their knowledge and belief, that no member of the City Council, officer, employee, or person, whose salary in whole or in part is provided by the City, County, or State, has a direct or indirect financial interest in the award of this bid, or in the work to which this bid relates, or in any of the profits, real or potential, thereof, except as noted otherwise herein.

THEREFORE, the undersigned hereby certifies that the information contained in these certifications and representations is accurate, complete and current. The undersigned, having fully examined the solicitation documents and all related material and information,

hereby offers and agrees that this bid shall be irrevocable and constitute a valid offer to the County for the costs presented.

Signature of Authorized Person	Printed Name & Title of Authorized Person
Firm's Name	Date

FIRST-TIER SUBCONTRACTOR DISCLOSURE FORM

Bartholomew Bldg. Standby Power System

Bid Closing: December 19, 2025, 9:00 AM PST
Form Disclosure Deadline: December 19, 2025, 11:00 AM PST

This form must be completed, signed and submitted via the County's Procurement Portal within two (2) working hours after the advertised bid closing time. In the table below, bidder shall list the name, contact person, and address of each subcontractor that will be furnishing labor or labor and materials, and whose contract value is equal to or greater than either i) 5% of the total project bid but at least $15,000; or ii) $350,000 regardless of the percentage total project bid. Also, bidder shall disclose the category of work that the subcontractor will performing and the dollar value of the subcontract. Attach additional sheets if needed.

If no subcontracts subject to the above disclosure requirements are anticipated, then bidder shall enter "none."

#	Subcontractor Name & Contact Person	Subcontractor Address	Category of Work	Dollar Amount of Work
1				
2				
3				
4				

Failure to submit this required form for total project bid amounts greater than $100,000.00 by the disclosure deadline or failure to submit the required information for each subcontractor will result in a non-responsive bid. A non-responsive bid will not be considered for award.

Form Submitted By: _____
Bidding Firm's Name

Contact Name: _____ Phone No: _____

(Printed Name of Contact Person)

BID SCHEDULE

Bartholomew Bldg. Standby Power System

The Bid Schedule is provided to prospective bidders as an Excel document for this Bid Booklet. The Bid Schedule is available on the solicitation page in the County's Procurement Portal. Bidders are required to download the Bid Schedule and submit the completed schedule with their submission. The Bid Schedule document includes instructions for bidders on how to fill out the schedule.

SPECIAL PROVISIONS
FOR
BARTHOLOMEW BLDG. STANDBY POWER SYSTEM

Install Standby Power System

Bartholomew Bldg. Standby Power System

Morrow County, OR

December 19, 2025

DESCRIPTION OF WORK

Install Standby Power System
Bartholomew Bldg. Standby Power System
Morrow County, OR

TIME AND PLACES OF RECEIVING BIDS (BID CLOSING)

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Submit electronic bids, on-line through Bid Express® (www.bidx.com) before 9:00:00 a.m. on the day of Bid Closing.

Submit paper bids to Sandi Pointer:

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For Bids submitted by mail or parcel delivery service, send to:

Irrigon Government Center
215 NE Main Ave.
Irrigon, Oregon, 97844

For Bids submitted by hand delivery, date stamp the Bid with the provided date stamping device and place into the Procurement Bid Box located in the 1st floor lobby at the following address:

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Bid Opening for the work described above will be at the following address:

Irrigon Government Center
215 NE Main Ave.
Irrigon, Oregon, 97844

, beginning at 9:00:00 a.m. on the day of Bid Closing “Don Adams Conference Room”.

COMPLETION TIME LIMIT

See Subsection 00180.50(h).

CLASS OF PROJECT

This is a State Project.

CLASS OF WORK

The Class of Work for this Project is: ELECTRICAL.

PROJECT INFORMATION

Information pertaining to this Project may be obtained from the following:

Spencer Goodall, P.E., Project Manager, Century West Engineering, 2120 N. Lakewood Dr. STE B, Coeur d'Alene, ID, 83814; or Email sgoodall@centurywest.com. All requests for information must be in writing with reference to the Project name.

TABLE OF CONTENTS FOR SPECIAL PROVISIONS

MORROW COUNTY, OREGON

SPECIAL PROVISIONS

FOR

BARTHOLOMEW BLDG. STANDBY POWER SYSTEM

PROFESSIONAL OF RECORD CERTIFICATION:

Seal w/signature	I certify the Special Provision Section(s) listed below are applicable to the design for the subject project for service modifications, power distribution, standby power, fuel system, and alarm autodialer. Modified Special Provisions were prepared by me or under my supervision.
 2025-12-02 EXPIRES: JUN 30, 2027	Section(s) 00092, 00100s, 00200s, 00960, 02001, 02560, 260000, 260001, 260002, 260126, 260519, 260526, 260533, 262416, 262713, 262800, 263213, and 269025

FINAL ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST

SPECIAL PROVISIONS

WORK TO BE DONE

The Work to be done under this Contract consists of the following:

1. Remove the existing electrical service to the Bartholomew Building.
2. Construct a new revised service, standby power system, fuel system, local power distribution, feeder, and an alarm autodialer for the Bartholmew Building.
3. Install, test, and commission all equipment for a complete and operational standby power system.
   Perform additional and Incidental Work as called for by the Specifications and Plans.

AUTHORITY OF CONSULTANT

The consultant will be directly in charge of the Project. However, the consultant's authority on this Project is as designated in the official "Consultant Agreement" for this Project, and as designated by the Engineer. This does not include authority to approve Contract changes or semifinal and Final Inspection of the Project.

APPLICABLE SPECIFICATIONS

The Specifications that are applicable to the Work on this Project is the 2024 edition of the "Oregon Standard Specifications for Construction", as modified by these Special Provisions. All Sections in Part 00100 apply, whether or not modified or referenced in the Special Provisions.

All number references in these Special Provisions shall be understood to refer to the Sections and subsections of the Standard Specifications bearing like numbers and to Sections and subsections contained in these Special Provisions in their entirety.

CLASS OF PROJECT

This is a State Project.

SECTION 00110 - ORGANIZATION, CONVENTIONS, ABBREVIATIONS AND DEFINITIONS

Comply with Section 00110 of the Standard Specifications modified as follows:

00110.05(e) Reference to Websites - Add the following bullet list to the end of this subsection:

- American Traffic Safety Services Association (ATSSA)
  www.atssa.com
- BidExpress
  www.bidx.com
- EquipmentWatch
  www.equipmentwatch.com
- ODOT Construction Section
  www.oregon.gov/odot/construction/pages/index.aspx
- ODOT Construction Section - Qualified Products List (QPL)
  www.oregon.gov/ODOT/Construction/Pages/Qualified-Products.aspx
- ODOT Construction Surveying Manual for Contractors
  www.oregon.gov/ODOT/ETA/Documents_Geometronics/Construction-Survey-Manual-Contractors.pdf
- ODOT Electronic Bidding Information Distribution System (eBids)
  (Also referred to as ODOT eBids website)
  https://ecmnet.odot.state.or.us/ebidse
- ODOT Environmental Product Declaration
  https://www.oregon.gov/odot/Construction/Pages/Environmental-Product-Declarations.aspx
- ODOT Estimating
  www.oregon.gov/ODOT/Business/Pages/Steel.aspx
- ODOT Oregon Trucking Online - "Highway Restriction Notice - Size and/or Weight" (Form No. 734-2357)
  www.oregontruckingonline.com/cf/MCAD/pubMetaEntry/restriction/

- ODOT Procurement Office - Conflict of Interest Guidelines and Disclosure Forms
  www.oregon.gov/ODOT/Business/Procurement/Pages/PSK.aspx
- ODOT Procurement Office - Construction Contracts Unit Notice of Intent
  www.oregon.gov/ODOT/Business/Procurement/Pages/NOI.aspx
- ODOT Procurement Office - Construction Contracts Unit prequalification forms
  www.oregon.gov/odot/business/procurement/pages/bid_award.aspx
- ODOT Traffic Control Plans Unit
  www.oregon.gov/ODOT/Engineering/Pages/Work-Zone.aspx
- ODOT Traffic Standards
  www.oregon.gov/ODOT/Engineering/Pages/Signals.aspx
- Oregon Legislative Counsel
  www.oregonlegislature.gov/lc
- Oregon Secretary of State: State Archives
  sos.oregon.gov/archives/Pages/default.aspx

00110.10 Abbreviations – Add the following paragraph to the end of this subsection:

EPD – Environmental Product Declaration

PCD - Pedestrian Channelizing Device

Delete the following paragraph:

DBE – Disadvantaged Business Enterprise

00110.20 Definitions – Add the following paragraphs to the end of this subsection:

Environmental Product Declaration - An environmental declaration providing environmental data using predetermined parameters and, where relevant, additional environmental information. *ISO 14025* refers to these as Type III Environmental Declarations.

Materially Unbalanced Bid - A Bid which generates a reasonable doubt that Award to the Bidder submitting a Mathematically Unbalanced Bid will result in the lowest ultimate cost to the Agency.

Mathematically Unbalanced Bid - A Bid containing lump sum or unit Pay Items (bid items) which do not reflect reasonable actual costs plus a reasonable proportionate share of the Bidder's anticipated profit, overhead costs and other indirect costs.

Pedestrian Accessible Route - An area for the use of pedestrians to navigate along sidewalks, driveways, curb ramps, crossings, and pedestrian facilities.

Pedestrian Channelizing Device - Devices used for channelizing pedestrians along a Temporary Pedestrian Accessible Route.

SECTION 00120 - BIDDING REQUIREMENTS AND PROCEDURES

Comply with Section 00120 of the Standard Specifications modified as follows:

00120.00 Prequalification of Bidders – Add the following bullet to the end of the bullet list:

- If delivered by electronic mail, the application shall be sent to:

  spointer@morrowcountyor.gov

Replace the bullet that begins “If delivered by mail…” with the following bullet:

- If delivered by mail or parcel delivery service, the application shall be sent to:

  Irrigon Government Center
  215 NE Main Ave.
  Irrigon, Oregon, 97844

00120.01 General Bidding Requirements - Replace the paragraph that begins “If the Bidder submits the Bid…” with the following paragraph:

If the Bidder submits the Bid electronically through BidExpress® as a joint venture, in addition to the joint venture signing with the digital signature and unique ID for the joint venture, the Bidder must also submit the signature pages from the Bid Booklet signed by each member of the joint venture, together with a statement the Bidder adds above or with the signatures as follows: “The following joint venture member signatures are for the Bid for the Bartholmew Bldg. Standby Power System Project submitted by the joint venture through BidExpress®. The signatures are on behalf of each joint venture member and the joint venture and also confirm that the signatory in BidExpress® was authorized to submit the Bid on behalf of the joint venture.” The Bidder must also email .pdf copies of the signature pages showing the signatures of the joint venture members with the required statement which must be received by Sandi Pointer, Morrow County Risk and Procurement Manager, at the Morrow County Procurement Office at: spointer@morrowcountyor.gov before the Closing date and time for the Bid. The signature pages with the original signatures must also be mailed or delivered to and received by Sandi Pointer, Morrow County Risk and Procurement Manager, at the address given in the Bid Book as a condition of Award.

The Agency will hold a prebid meeting (Virtual and In-Person) for all holders of Solicitation Documents at the Irrigon Government Center (Don Adams Conference Room), located at 215 NE Main Ave. in Irrigon, Oregon at 10:00AM on December 15, 2025.

The prebid meeting is voluntary and any prospective Bidders may or may not attend this meeting at their discretion.

Prospective Bidders will be given the opportunity to ask questions relating to any details involved in the performance of the Work under the Contract.

Information distributed, statements made or responses given to questions, by the Agency's representatives at the prebid meeting will not in any way alter or affect any of the provisions

contained in the Solicitation Documents or Contract requirements and will not be binding upon the Agency unless confirmed by Addenda.

00120.05 Request for Plans, Special Provisions, and Bid Booklets - Add the following to the end of this subsection:

The Plans, which are applicable to the Work to be performed under the Contract, bear title and date as follows:

Install Standby Power System
Bartholomew Bldg. Standby Power System
Morrow County, OR
December 2025

00120.10 Bid Booklet – Replace the bullet that begins "Appendix, which includes…" with the following bullet:

- Appendix, which includes required time-sensitive forms, sample forms, and other informational pages

SECTION 00130 - AWARD AND EXECUTION OF CONTRACT

Comply with Section 00130 of the Standard Specifications modified as follows:

00130.40 Contract Submittals - Add the following paragraph to the end of this subsection:

The Agency, in its sole discretion, may require execution of documents identified in subsections (a), (b) and (c) with a form of electronic signature (including but not limited to sealing and signing) acceptable to the Agency.

00130.40(c) Workers' Compensation – Replace this subsection, except for the subsection number and title, with the following:

To certify compliance with the workers' compensation insurance coverage required by 00170.61(a) and 00170.70(e), the successful Bidder shall complete and sign the "Certification of Workers' Compensation Coverage" form bound in the Contract booklet.

00130.50 Execution of Contract and Bonds - Add the following paragraph to the end of this subsection:

The Agency, in its sole discretion, may require execution of documents identified in subsection (a) with a form of electronic signature (including but not limited to sealing and signing) acceptable to the Agency.

SECTION 00140 - SCOPE OF WORK

Comply with Section 00140 of the Standard Specifications.

SECTION 00150 - CONTROL OF WORK

Comply with Section 00150 of the Standard Specifications modified as follows:

00150.50(c) Contractor's Responsibilities – Replace the bullet that begins "In addition to the notification required…" with the following bullet:

- In addition to the notification required in OAR 952-001-0090(7), notify the Engineer and the Utility as soon as the Contractor discovers any previously unknown Utility conflicts or issues. Contrary to the OAR, stop excavating until directed by the Engineer and allow the Utility a minimum of two weeks to relocate or resolve the previously unknown Utility issues; and

Add the following subsection:

00150.50(g) Utility Information (Anticipated Relocations):

The organizations list in Table 00150-2 may be adjusting Utilities within the limits of the Project during the period of the Contract with relocation Work estimated to be completed by the following dates and times:

Table 00150-2

Subsection	Utility	Contact Person's Name, Address, Email, and Phone Number	Estimated Completion Date
00150.50(g)(1)	Columbia Basin Co-Op	Brian Kollman BrianK@columbiabasin.cc 171 W Linden Way, Heppner, OR 97836 tel:5416769146	5/31/26

SECTION 00160 - SOURCE OF MATERIALS

Comply with Section 00160 of the Standard Specifications modified as follows:

00160.01(a) All Materials – Replace the paragraph that begins "The Contractor shall identify…" with the following paragraph:

When the estimated value is over $10,000, the Contractor shall submit a copy of the materials purchase order or supply agreement.

Delete the paragraph that begins "For this purpose…".

00160.20 Preferences for Materials - Add the following paragraph to the beginning of this subsection:

Section 1518 of Moving Ahead for Progress in the 21st Century Act provides that Buy America applies to all Contracts eligible for federal assistance under Title 23, United States Code, included within the scope of an applicable National Environmental Policy Act (NEPA) finding, determination or decision, regardless of the funding source of such Contracts, where at least one Contract is funded with Title 23 funds. This Contract includes Title 23 funds under such a NEPA finding, determination or decision and Buy America under subsection (a) and Build America Buy America under subsection (d) apply to this Contract.

Option B= Federal Buy America laws apply.

If $500,000 or more of federal highway funds are involved on the Project, the Contractor shall limit the quantity of foreign Materials incorporated into the Work as follows. Section 635.410 of Title 23, Code of Federal Regulations, and the Intermodal Surface Transportation Efficiency Act require that all iron or steel manufacturing processes, including, without limitation, the casting of ingots, for iron or steel Materials permanently incorporated into the Project shall occur in the United States, unless the cost of foreign-origin iron or steel Materials does not exceed one-tenth of one percent (0.1%) of the Contract Amount or $2,500, whichever is greater. Buy America requirements apply to any steel or iron component of a manufactured product regardless of the overall composition of the manufactured product (e.g., Buy America applies to the steel wire mesh or steel reinforcing components of a precast reinforced concrete pipe). The Contractor shall not incorporate foreign-origin iron or steel Materials in excess of this amount into the Project. All foreign-origin iron or steel Materials incorporated in the Project in excess of the amount indicated above shall be removed and replaced with domestic iron or steel Materials at the Contractor's expense. For purposes of this Specification, the cost of foreign-origin iron or steel Materials shall be the value of the iron or steel products as of the date they are delivered to the Project Site.

Manufacturing processes include without limitation the casting of ingots and the application of coatings to finished iron or steel products or components. Coatings include epoxy coating, galvanizing, painting, and any other coating that protects or enhances the value of the steel or iron product or component. The Contractor shall provide the Engineer with a Certificate of Materials Origin, on a form furnished by the Engineer, before incorporating any iron or steel products into the Project. Unless a Certificate of Materials Origin has been provided to the Engineer, the Materials shall be considered of foreign origin.

The Contractor shall retain manufacturers' certificates verifying the origin of all domestic iron or steel Materials for 3 years after the date of final payment for the Project, and shall furnish copies to the Engineer upon request.

The Contractor shall include this provision in all subcontracts.

00160.20(d) Build America Buy America Act Requirements – Replace this subsection, except for the subsection number and title, with the following:

If federal highway funds are involved on the Project, the Contractor shall comply with the Build America Buy America Act and implementing regulations (Infrastructure Investment and Jobs Act ("IIJA"), Pub. L. No. 117-58, which includes the Build America, Buy America Act ("the Act"). Pub. L. No. 117-58, Sections 70901-70941).

The Build America Buy America Act requirements apply to construction materials and manufactured products permanently incorporated in the Project. All construction materials and manufactured products permanently incorporated in the Project must be produced in the United States.

Construction materials include an article, Material, or supply that is or consists primarily of only one of the following, with the standard for the material to be considered ''produced in the United States'':

- **Non-ferrous metals -** All manufacturing processes, from initial smelting or melting through final shaping, coating, and assembly, occurred in the United States.
- **Plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables)** - All manufacturing processes, from initial combination of constituent plastic or polymer-based inputs, or, where applicable, constituent composite materials, until the item is in its final form, occurred in the United States.
- **Glass (including optic glass)** - All manufacturing processes, from initial batching and melting of raw materials through annealing, cooling, and cutting, occurred in the United States.
- **Fiber optic cable (including drop cable)** - All manufacturing processes, from the initial ribboning (if applicable), through buffering, fiber stranding and jacketing, occurred in the United States. All manufacturing processes also include the standards for glass and optical fiber, but not for non-ferrous metals, plastic and polymer-based products, or any others.
- **Optical fiber** - All manufacturing processes, from the initial preform fabrication stage through the completion of the draw, occurred in the United States.
- **Lumber** - All manufacturing processes, from initial debarking through treatment and planing, occurred in the United States.
- **Drywall** - All manufacturing processes, from initial blending of mined or synthetic gypsum plaster and additives through cutting and drying of sandwiched panels, occurred in the United States.
- **Engineered wood** - All manufacturing processes from the initial combination of constituent materials until the wood product is in its final form, occurred in the United States.

The classification of an article, material, or supply as construction material is based on its status at the time it is brought to the work site for incorporation in the Project. In general, the work site is the location of the Project at which the construction materials will be incorporated.

FHWA issued a final rule on January 14, 2025 amending FHWA's Buy America regulation to terminate FHWA's general waiver for manufactured products and establish Buy America requirements for manufactured products with respect to Federal-aid highway projects. https://www.federalregister.gov/documents/2025/01/14/2024-31350/buy-america-requirements-for-manufactured-products

Manufactured products assembled outside the Project Site are also subject to the Build America Buy America requirements. Manufactured products means articles, materials, or supplies that have been:

- Processed into a specific form and shape; or
- Combined with other articles, materials, or supplies to create a product with different properties than the individual articles, materials, or supplies.

For manufactured products, the final assembly of the product shall occur within the United States for projects obligated on or after October 1, 2025. For projects obligated after October 1, 2026, the cost of the components of the product that are mined, produced or manufactured in the United States shall be more than 55 percent of the total cost of all components of the product.

The USDOT issued a Public Interest Waiver for De Minimis Costs and Small Grants. The final waiver can be viewed here: https://www.federalregister.gov/documents/2023/08/16/2023-17602/waiver-of-buy-america-requirements-for-de-minimis-costs-and-small-grants and this waiver applies to Materials covered by the Build America Buy America Act.

The public interest waiver is for manufactured products and construction materials for which:

- The total value of the non-compliant products (foreign or unknown origin) is no more than the lesser of $1,000,000 or 5% of total applicable costs for the project*; or
- The total amount of Federal financial assistance applied to the project, through awards or subawards, is below $500,000.

*The “total value of the non-compliant products” includes construction materials and manufactured products only. The “total applicable costs” includes construction materials, iron and steel, and manufactured products. The value of materials are the actual cost of the materials, not the anticipated cost of materials. Furthermore, this bullet does not apply to iron and steel subject to the requirements of 23 U.S.C. 313. The de minimis threshold in 23 CFR 635.410(b)(4) continues to apply for steel and iron. (See 00160.20(a).)

Strict compliance with the Build America, Buy America domestic preferences is required, except to the extent the above public interest waiver applies. The Contractor shall not incorporate construction materials and manufactured products in excess of this amount into the Project. All foreign origin construction materials and manufactured products incorporated

in the Project in excess of the amount indicated above shall be removed and replaced with domestic construction materials at the Contractor's expense.

The Contractor shall provide the Engineer with a Certificate of Materials Origin, on a form furnished by the Engineer, before incorporating any applicable construction materials and manufactured products into the Project. Unless a Certificate of Materials Origin has been provided to the Engineer, the products and Materials shall be considered of foreign origin.

The Contractor shall retain manufacturers' certificates verifying the origin of all applicable construction materials and manufactured products for 3 years after the date of final payment for the Project, and shall furnish copies to the Engineer upon request.

Iron and steel Materials and manufactured products that are predominately iron or steel are subject to 00160.20(a).

The Contractor shall include this provision in all subcontracts.

00160.65 Environmental Product Declaration – Pursuant to ORS 184.879 and OAR 731-005-0910, provide an Environmental Product Declaration for the following materials:

- Concrete, including ready mix concrete, shotcrete, precast concrete and concrete masonry units;
- Asphalt paving mixtures;
- Steel, including rebar, reinforcing steel and structural steel, hot-rolled sections, hollow sections, plate steel and cold-formed steel.

Submit an EPD according to the *ODOT Environmental Product Declaration Manual (see 00110.05(e))*.

The most current published PDF version of the *ODOT Environmental Product Declaration Manual* on the date of Advertisement is the version in effect for the Project.

The EPD must be accepted by the Engineer before the product is incorporated into the Project unless the product is procured under a listed exemption in ODOT's *Environmental Product Declaration Manual*.

SECTION 00165 - QUALITY OF MATERIALS

Comply with Section 00165 of the Standard Specifications modified as follows:

00165.35(e) Certificate of Origin of Construction Materials – Replace this subsection, except for the subsection number and title, with the following:

When a certificate of material origin for construction materials is specified, complete the form furnished by the Engineer as required by 00160.20(d) for Federal-aid projects.

SECTION 00170 - LEGAL RELATIONS AND RESPONSIBILITIES

Comply with Section 00170 of the Standard Specifications modified as follows:

Add the following subsection:

00170.07 Record Requirements - Replace the paragraph that begins "For purposes of this Subsection, the term …" with the following paragraph:

For purposes of this Subsection, the term "Contractor" includes the Contractor, all Subcontractors, Material Suppliers, and providers of rented operated Equipment (except truck drivers), at all tiers, for all subcontracts with first-tier Subcontractors, all subcontracts between the first-tier Subcontractors and their Subcontractors and any other lower-tier subcontracts, and "Related Entities" as that term is defined in OAR 734-010-0400. The Material Suppliers included in this definition are those for Aggregates, asphalt cement concrete, Portland cement concrete and the supply and fabrication of structural steel items, and Material Suppliers that provide quotes.

00170.07(a) Records Required - Replace the paragraph that begins "The Contractor shall include in its subcontracts …" with the following paragraph:

The Contractor shall include in its subcontracts, purchase orders, and all other written agreements, a provision requiring all Subcontractors, Material Suppliers and providers of rented operated Equipment(except truck drivers), at all tiers, to comply with 00170.07. The Contractor shall also require all Subcontractors, Material Suppliers, and providers of rented operated Equipment (except truck drivers), at all tiers, and Related Entities to include in their contracts, purchase orders, and all other written agreements, a provision requiring all lower-tier Subcontractors, Material Suppliers and providers of rented operated Equipment (except truck drivers) to comply with 00170.07. The Material Suppliers to which this applies are those for Aggregates, asphalt cement concrete, portland cement concrete and the supply and fabrication of structural steel items and Material suppliers that provide Material quotes and Related Entities as defined in OAR 734-010-0400.

00170.10(g) Paid Summary Report – Delete the bullet that begins “Committed DBE…”.

Replace the bullet that begins "Non-committed DBE …" with the following bullet:

Suppliers and service providers with estimated total payments for the Project over $10,000.

Delete the paragraph that begins “For this purpose…”.

Replace the paragraph that begins "Submit the completed and signed Paid …" with the following paragraph:

Submit the completed and signed Paid Summary Report to the Engineer within 20 Calendar Days of receipt of payment from the Agency for each month in which payments were made to each Subcontractor, and each Supplier or service provider with estimated total payments for the Project over $10,000. At the completion of the Project, submit form 734-2882

recapping the total amounts paid to each Subcontractor, and each Supplier or service provider with estimated total payments for the Project over $10,000.

00170.61(a) Workers' Compensation - Replace this subsection with the following subsection:

00170.61(a) Workers' Compensation and Employer's Liability - The Contractor shall provide workers' compensation and employer's liability coverage for on-the-job injuries as required by 00170.70(e).

00170.65(b)(1) Minimum Wage Rates – Replace the paragraph that begins "The Bureau of Labor and Industries (BOLI) …" with the following paragraph:

The Bureau of Labor and Industries (BOLI) determines and publishes the existing State prevailing wage rates in the publication *Prevailing Wage Rates for Public Works Contracts*. The Contractor shall pay workers not less than the specified minimum hourly wage rate according to ORS 279C.838 and ORS 279C.840, and shall include this requirement in all subcontracts.

00170.70(a) Insurance Coverages - Replace the paragraph that begins "**Contractor** – The Contractor shall…" with the following paragraph:

Contractor - The Contractor shall obtain the insurance specified below prior to the execution of the Contract. The Contractor shall maintain the insurance in full force at the Contractor's expense throughout the duration of the Contract and as required by an extended reporting period or tail coverage requirements, and all warranty periods that apply.

Replace the paragraph that begins "**Insurance Provisions** - The Contractor and Subcontractor(s), if…" with the following paragraph:

Insurance Provisions - The Contractor and Subcontractor(s), if any, shall obtain insurance from insurance companies or entities that are authorized to transact the business of insurance and issue coverage in the State and that are acceptable to the Agency. Insurance coverage shall be primary and noncontributory with any other insurance and self-insurance, with the exception of Workers' Compensation/Employer's Liability. The Contractor, or appropriate Subcontractor, but not the Agency, shall pay for all deductibles, self-insurance retentions and self-insurance, if any.

Replace the paragraph that begins "**Commercial General Liability** - The Contractor shall provide Commercial…" with the following paragraph:

Commercial General Liability - The Contractor shall provide Commercial General Liability Insurance written on an occurrence basis and covering the Contractor's liability for bodily injury, property damage, personal and advertising injury, products and completed operations, and contractual liability. Coverage may be written in combination with Commercial Automobile Liability Insurance with separate limits for Commercial General Liability and Commercial Automobile Liability. Combined single limit per occurrence shall not be less than the dollar amount specified in the Special Provisions. The annual aggregate limit shall not be less than the dollar amount specified in the Special Provisions. The policy shall be endorsed to state that the annual aggregate limit of liability shall apply separately to the Contract.

Add the following to the end of this subsection:

The following insurance coverages and dollar amounts are required pursuant to this subsection:

Insurance Coverages	Combined Single Limit per Occurrence	Annual Aggregate Limit
	(Fill in the blanks with the dollar amounts from the insurance risk assessment.)	
Commercial General Liability	$_____	$_____
Commercial Automobile Liability	$_____	(aggregate limit not required)

00170.70(b) Extended Reporting - Replace the paragraph that begins "The Contractor or Subcontractor shall…" with the following paragraph:

The Contractor or Subcontractor shall furnish certification of this extended reporting requirement as a condition to receive Third Notification under 00150.90(b) and 00180.50(g).

00170.70(c) Excess/Umbrella Liability - Replace this subsection, except for the subsection number and title, with the following:

A combination of primary and Excess/Umbrella Liability Insurance may be used to meet the required minimum limits of insurance. If any Excess/Umbrella Liability policies are in place, they must be on a true “following form” or broader coverage basis, with coverage at least as broad as provided on the underlying insurance. In addition, the limits of the underlying insurance must be sufficient to prevent any gap between such minimum limits and the attachment point of the coverage provided by the Excess/Umbrella Liability policy.

00170.70(d) Additional Insured - Replace the paragraph that begins "The liability insurance coverages of 00170.70(a)…" with the following paragraph:

The liability insurance coverages of 00170.70(a) shall include an Additional Insured Endorsement endorsing the “State of Oregon, the Oregon Transportation Commission and the Oregon Department of Transportation, and their respective officers, members, agents, and employees” as Additional Insureds, but only with respect to the Contractor's activities to be performed under the Contract. Coverage shall be primary and non-contributory with any other insurance and self-insurance. The liability coverages of 00170.70(a) that are permitted by the Agency to be obtained by an appropriate Subcontractor shall include all of the foregoing as Additional Insureds and shall also include the Contractor and its officers and employees as Additional Insureds.

Add the following paragraph and bullet to the end of this subsection:

- Century West Engineering

00170.70(e) Workers' Compensation - Replace the title of this subsection with “**Workers' Compensation and Employer’s Liability”**

00170.70(g) Certificate(s) of Insurance - Replace the bullet that begins "List the “State of Oregon…" with the following bullet:

- List the “State of Oregon, the Oregon Transportation Commission and the Oregon Department of Transportation, and their respective officers, members, agents and employees” as a Certificate holder and endorse as an Additional Insured;

Replace the bullet that begins “Specify that all liability insurance …" with the following bullet:

- Specify that all liability insurance coverages shall be primary and noncontributory with any other insurance and self-insurance, with exception of Workers’ Compensation/Employer’s Liability;

Replace the bullet that begins "Include a list of all policies…" with the following bullet:

- Include a list of all policies that fall under the Excess/Umbrella Liability Insurance if Excess or Umbrella Liability Insurance is used to meet the minimum insurance requirements .

00170.70(i) Insurance Requirement Review - Replace this subsection, except for the subsection number and title, with the following:

The Contractor agrees to periodic review of insurance requirements by Agency. Agency reserves the right to periodically assess risks and the adequacy of insurance coverage and in its discretion to require additional insurance coverage or increased coverage limits on existing coverages, or both.

The policy shall include as loss payee, the Agency and Heppner, OR.

00170.72 Indemnity/Hold Harmless - Add the following paragraph and bullet to the end of this subsection:

Extend indemnity, defense and hold harmless to the Agency and the following:

- Century West Engineering

SECTION 00180 - PROSECUTION AND PROGRESS

Comply with Section 00180 of the Standard Specifications modified as follows:

00180.20(d) Disadvantaged Business Enterprise (DBE) – Delete this subsection.

00180.20(e) Trucking - Replace the paragraph that begins "This Section does not apply to…" with the following paragraph:

This Section does not apply to delivery of Materials by or for or from a Supplier. This Subsection applies to all truck hauling of materials not performed with trucks owned (or rented) and operated by the Contractor.

00180.20(e)(1) Trucking - Delete the bullet that begins "Statement specifying whether the services will be provided by a DBE…".

00180.20(e)(2) Limitations - Replace the paragraph that begins "The approved trucking services agreements…" with the following paragraph:

The approved trucking services agreements shall be used for all trucking services for hauling materials not provided by trucks owned (or rented) and operated by the Contractor. The Contractor shall execute a trucking services agreement with every trucking services provider for hauling materials prior to the trucking services provider doing any Work on the Project Site.

00180.21(a) General – Replace the bullet that begins "If the Subcontractor is providing any…" with the following bullet:

- If the Subcontractor is providing any of the insurance coverages as permitted under 00170.70(a), the Agency will respond within 35 Calendar Days after the Engineer's receipt of the request. (28 Calendar Days for the Agency to review and approve the Certificates of Insurance required by 00170.70(g) plus 7 Calendar Days to review and approve the subcontract request.)

The Contractor shall be aware of and subject to schedule limitations in the Standard Specifications that are not listed in this subsection.

00180.41 Project Work Schedules -

Add the following subsection:

00180.50(h) Contract Time - There is one Contract Time on this Project as follows:

The Contractor shall complete all Work to be done under the Contract not later than May 31, 2026.

SECTION 00190 - MEASUREMENT OF PAY QUANTITIES

Comply with Section 00190 of the Standard Specifications.

SECTION 00195 - PAYMENT

Comply with Section 00195 of the Standard Specifications modified as follows:

00195.12(d) Steel Materials Pay Item Selection - Add the following paragraph to the end of this subsection:

No Pay Items under this Contract qualify for the steel escalation/de-escalation program for this Project.

00195.50(c)(1) Cash, Alternate A – Replace this subsection, except for the subsection number and title, with the following:

Retainage will be deducted from progress payments and held by the Agency until final payment is made according to 00195.90, unless otherwise specified in the Contract.

Except as otherwise provided, the Agency will deposit the cash retainage withheld in an interest bearing account, established through the State Treasurer for the benefit of the Agency, as required by ORS 279C.560(5). Interest earned on the account shall accrue to the Contractor. Amounts retained and interest earned will be included in the final payment made according to 00195.90, unless otherwise specified in the Contract.

Any retainage withheld on Work performed by a Subcontractor will be released to the Contractor according to 00195.50(d).

00195.50(c)(2) Cash, Alternate B (Retainage Surety Bond) - Replace this subsection, except for the subsection number and title, with the following:

The Contractor may submit a Surety bond in lieu of all or a portion of the retainage required under the Contract. The Agency will accept this Surety bond unless the Agency first finds in writing good cause for rejection based on unique project circumstances in accordance with ORS 279C.560(1)(c).

The Surety bond must be in substantially the form specified in ORS 701.435 (4) (Oregon House Bill 4006, 2024), and executed by a Surety bonding company that is authorized to transact Surety business in the State of Oregon and may not be a Surety obligation of an individual. The Surety bond and any proceeds of the Surety bond must be made subject to all claims and liens and in the same manner and priority specified for retainage under ORS 279C.550 to 279C.570 and ORS 279C.600 to 279C.625. Agency will reduce the cash retainage held by an amount equal to the value of the Surety bond and pay the amount of the reduction to Contractor according to ORS 279C.570. Any retainage withheld on Work performed by a Subcontractor will be released to the Contractor according to 00195.50(d).

When the Agency accepts a Surety bond in lieu of retainage from the Contractor, the Contractor shall accept Surety bonds from Subcontractors or Suppliers from which the Contractor has withheld retainage. At any time before final payment a Subcontractor may submit a Surety bond to the Contractor and request that the Contractor submit a Surety bond as described above for the portion of the Contractor's retainage that pertains to the Subcontractor. The Surety bond the Subcontractor provides to the Contractor must meet the

Agency requirements specified in the paragraph above. When a Contractor at a Subcontractor's request obtains and submits a Surety bond under this subsection, the Contractor may withhold from payments to the Subcontractor an amount equivalent to the portion of the Contractor's Surety bond premium for which the Subcontractor is responsible in accordance with ORS 279C.560 (Oregon House Bill 4006, 2024).

Within 30 Days after a Subcontractor's request the Contractor shall provide a Surety bond as described above, and the Agency will accept the Surety bond unless:

- the Agency finds in writing good cause for rejection based on unique project circumstances in accordance with ORS 279C.560;
- a Surety bond is not commercially available;
- the Subcontractor refuses to pay to the Contractor the Subcontractor's portion of the Surety bond premium; or
- the Subcontractor refuses to provide the Contractor with a Surety bond that meets the requirements of ORS 279C.560(1)(b).

Notwithstanding 00195.50(d), within 30 Days of receiving a Surety bond from Contractor at a Subcontractor's or Supplier's request, Agency will release to the Contractor the amount held as retainage that is equivalent to the amount the Contractor submitted as a Surety bond. Contractor shall, within 30 Days after receiving a Surety bond from a Subcontractor or Supplier, release to the Subcontractor or Supplier the amount the Contractor holds as retainage that is equivalent to the amount of the Surety bond submitted, in accordance with ORS 279C.560(8).

00195.50(c)(3) Bonds, Securities, and Other Instruments - Replace this subsection, except for the subsection number and title, with the following:

Contractor may deposit bonds, securities or other instruments with the Agency or in a bank or other financial institution, to be held by Agency instead of cash retainage for the benefit of the Agency, which the Agency will accept unless the Agency first finds in writing good cause for rejection based on unique project circumstances, in accordance with ORS 279C.560(1)(c).

If the Contractor deposits bonds, securities or other instruments, and Agency does not reject the bonds, securities or other instruments as permitted by ORS 279C.560(1)(c), the Agency will reduce the cash retainage by an amount equal to the value of the bonds, securities and other instruments. Interest or earnings on the bonds, securities and other instruments accrue to the Contractor.

Bonds, securities and other instruments deposited instead of cash retainage shall be of a character approved by the Director of the Oregon Department of Administrative Services, including, but not limited to:

- Bills, certificates, notes or bonds of the United States;
- Other obligations of the United States or agencies of the United States;
- Obligations of a corporation wholly owned by the federal government;
- Indebtedness of the Federal National Mortgage Association;

- General obligation bonds of the State of Oregon or a political subdivision of the State of Oregon;
- Irrevocable letters of credit issued by an insured institution, as defined in ORS 706.008.

00195.50(f) Prompt Payment Policy - Replace this subsection, except for the subsection number and title, with the following:

Payments shall be made promptly according to ORS 279C.560, ORS 279C.570, ORS 279C.580 and other applicable legal requirements.

SECTION 00196 - PAYMENT FOR EXTRA WORK

Comply with Section 00196 of the Standard Specifications.

SECTION 00197 - PAYMENT FOR FORCE ACCOUNT WORK

Comply with Section 00197 of the Standard Specifications modified as follows:

00197.20(e) Standby Time - Replace this subsection, except for the subsection number and title, with the following:

If ordered by the Engineer, standby time will be paid at 50% of the hourly rental rate calculated according to this Subsection, excluding the hourly operating rate. Rates for standby time that are calculated at less than $1 per hour will not be paid. Payment will be limited to not more than 8 hours in a 24-hour period or 40 hours in a 1 week period.

00197.80 Percentage Allowances - Replace the table that shows Subsection and Percent with the following:

Subsection	Percent
00197.10 Materials	19
00197.20 Equipment	19
00197.30 Labor	29
00197.40 Special Services	19

Replace the paragraph that begins "When a Subcontractor performs ordered…" with the following paragraph:

When a Subcontractor performs ordered Force Account Work, the Contractor will be allowed a supplemental markup of 10% on each Force Account Work order.

SECTION 00199 - DISAGREEMENTS, PROTESTS, AND CLAIMS

Comply with Section 00199 of the Standard Specifications.

SECTION 00210 - MOBILIZATION

Comply with Section 00210 of the Standard Specifications.

SECTION 00220 - ACCOMMODATIONS FOR PUBLIC TRAFFIC

Comply with Section 00220 of the Standard Specifications modified as follows:

00220.01(b) Abbreviations - Delete this subsection.

SECTION 00290 - ENVIRONMENTAL PROTECTION

Comply with Section 00290 of the Standard Specifications modified as follows:

00290.30 Pollution Control – Replace the paragraph that begins "Prevent, control, and abate…" with the following paragraph:

Prevent, control, and abate pollution of the environment.

00290.30(a)(1) General - Replace this subsection, except for the subsection number and title, with the following:

- Do not allow any foreign substances or objects to enter waters of the State and U.S. that exceed regulated or permit limits.
- Do not cause turbidity in waters of the State and U.S. that exceeds regulated or permit limits.

SECTION 00960 - COMMON PROVISIONS FOR ELECTRICAL SYSTEMS

Comply with Section 00960 of the Standard Specifications modified as follows:

00960.30 Licensed Electricians – Replace this subsection, except for the subsection number and title, with the following:

According to the Oregon Administrative Rule 918-282-0120(1), no person or Entity shall allow any individual to perform electrical work for which the individual is not properly registered or licensed. Every person who installs electrical systems on the Project shall submit a copy of their electrical license or apprentice registration to the Engineer prior to performing any Work. They must be licensed as an S or a J under Oregon Administrative Rule 918-282-0140 or 918-282-0170.

Add the following subsection:

00960.42(c) Metallic Conduit – Paint the following with rust-preventative coating:

- Threads on all metal conduit.
- Areas where the coating has been damaged so underlying metal is exposed.
- Exposed, ungalvanized threads resulting from field cuts.

If corrosive Soil conditions exist, coat metallic conduit with a nonmetallic coating or wrap with corrosion protection tape at least 10 mils thick.

Add the following subsection:

00960.42(d) Connecting Non-Metallic Conduit to Metallic Conduit - Use a nonmetallic female threaded connector to connect nonmetallic conduit to metallic conduit.

Add section **260000 – Electrical General Provisions**, see attached.

Add section **260001 – Electrical Scope of Work**, see attached.

Add section **260002 – Basic Materials and Methods**, see attached.

Add section **260126 – Electrical Testing**, see attached.

Add section **260519 – Wire and Cable**, see attached.

Add section **260526 – Grounding**, see attached.

Add section **260533 – Raceways**, see attached.

Add section **262416 – Panelboards**, see attached.

Add section **262713 – Service and Metering**, see attached.

Add section **262800 – Overcurrent Protective Devices**, see attached.

Add section **263213 – Power Generation**, see attached.

Add section **269025 – Control Components**, see attached.

SECTION 02001 - CONCRETE

Comply with Section 02001 of the Standard Specifications modified as follows:

02001.15(b)(2)(d) Permeability Tests - Replace this subsection, except for the subsection number and title, with the following:

For alternate HPC mix designs, select from the following options:

- Make at least three specimens from the trial batch for permeability testing. Prepare, cure, dry and test according to AASHTO T 277. Report permeability in coulombs at 90 Days.
- Make at least two specimens from the trial batch for resistivity testing. Prepare, cure and test according to AASHTO T358 using the sealed conditioning method. Report resistivity in kΩ·cm at 56 Days.

02001.20(e) Durability - Replace the paragraph that begins "[1] Only required for alternate HPC designs. See …" with the following paragraph:

[1] Only required for alternate HPC designs. See 02001.30(b)(2). A minimum resistivity of 37.0 kΩ·cm at 56 Days for 4x8 inch cylinders and 29 kΩ·cm at 56 Days for 6x12 inch cylinders will be accepted as equal when tested according to AASHTO T358 using the sealed conditioning method.

SECTION 02560 - FASTENERS

Comply with Section 02560 of the Standard Specifications modified as follows:

02560.60(a)(1) Method 1 – Replace the paragraph that begins “Continue to tighten the nut until…” with the following:

Continue to tighten the nut until the nut has turned twice the rotation shown in Table 00560-3 of Section 00560 from its snug-tight position mark for bolt lengths up to 8D (for greater than 8D up to 12D bolt lengths tighten to 1 1/6 turn from snug-tight).

SECTION 26 00 00
ELECTRICAL GENERAL PROVISIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Contract requirements

B. Codes, permits and fees

C. Quality assurance and standards

D. Site visit and familiarization

E. Submittals

F. Coordination of electrical work

G. Material and workmanship

H. Space requirements

I. Safety regulations

J. Delivery, storage and handling of materials

1.2 RELATED SECTIONS

A. Related Sections include but are not necessarily limited to:

1. Division 0 - Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 1 - General Requirements.
3. Section 26 00 01 – Electrical Scope of Work
4. Section 26 00 02 – Basic Materials and Methods
5. Section 26 01 26 – Electrical Testing
6. Section 26 05 19 – Wire and Cable
7. Section 26 05 26 – Grounding
8. Section 26 05 33 – Raceways
9. Section 26 24 16 – Panelboards
10. Section 26 27 13 – Service and Metering
11. Section 26 28 00 – Overcurrent Protective Devices
12. Section 26 32 13 – Power Generation
13. Section 26 90 25 – Control Components

1.3 STANDARDS AND REFERENCES

A. Refer to Division 1 for general administrative/procedural requirements related to compliance with applicable standards.

B. This Work and all materials shall meet the standards set forth in the applicable portions of the following recognized standards:

1. ANSI – American National Standards Institute.
2. ASHRAE – American Society of Heating Refrigerating & Air-Conditioning Engineers.
3. ASME – American Society of Mechanical Engineers.
4. ASPE – American Society of Plumbing Engineers.

5. ASTM – American Society for Testing and Materials.
6. CBM – Certified Ballast Manufacturers.
7. ETL – Electrical Testing Laboratory.
8. FM – Factory Mutual Engineering Corporation.
9. IEEE – Institute of Electrical and Electronics Engineers.
10. IES – Illuminating Engineering Society of North America.
11. NEC – National Electric Code (by NFPA).
12. NEMA – National Electrical Manufacturers Association.
13. NFPA – National Fire Protection Association.
14. UL – Underwriters' Laboratories Inc.

1.4 SUBMITTALS

A. General: Submittals required for this project shall include, but are not be limited to:
   1. Shop Drawings and Product Brochure Submittals.
   2. Record (as-installed) Drawings.
   3. Certifications and Test Reports.
   4. Operating and Maintenance Manuals.
   5. Warranties (Guarantees).
   6. Refer to Division 1 for additional submittal requirements.

B. Shop Drawings and Product Brochure Submittals:
   1. The terms "Submittal" and "Shop Drawing" in this Specification are defined as either product literature, samples of equipment, or actual Shop Drawings.
   2. The Contractor shall submit at minimum one (1) electronic PDF copy of Shop Drawings and complete data covering each item or equipment or material. The Owner and Engineer will each retain one (1) copy of all Shop Drawing submittals for their files.
   3. Submittals shall be provided with a cover sheet with the names and addresses of the Project, Engineer, General Contractor, and the Subcontractor making the submittal. The cover sheet shall also contain the Specification section number applicable to the item or items submitted, the item nomenclature and description and a submittal number. Electrical submittals shall be numbered sequentially by Specification section with a sequence suffix (e.g. 26 05 19-1, 26 06 33-2, etc.). Re-submittals shall be numbered with the original submittal number plus an "R" in the sequence suffix (e.g. the re-submittals of submittal 26 05 19-1 would be 26 05 19-1RI, 26 05 19-1R2).
   4. Submittals shall be provided with an index page with a listing of all data included in the submittal.
   5. Submittals shall be provided with a list of variations, including unfurnished or additional items or features between the submitted equipment and the specified equipment. If there are no variations, then this page shall state "No Variations". Where variations affect the work of other contractors, then the contractor shall certify on this page that these variations have been fully coordinated with the affected contractors and that the submitting contractor shall pay all additional costs to the affected contractors associated with the variations.
   6. Submittals shall provide equipment information including manufacturer's name and designation, size, performance and capacity data. All applicable listings, labels, approvals and standards shall be clearly indicated.
   7. Submittals shall provide dimensional data and actual sketches as applicable to show that the submitted equipment will fit the space available with all required Code and maintenance clearances.

8. Submittals shall include an identification of each item of material or equipment matching that indicated on the Drawings.
9. Submittals shall provide sufficient pictorial, descriptive and diagrammatic data on each item to show its conformance with the Drawings and Specifications. Any options or special requirements shall be so indicated. All applicable information shall be clearly indicated with arrows or another approved method. Any non-applicable information shall be crossed out.
10. Submittals shall include additional information as required in other sections of this Division.
11. Submittals shall include certification by the General Contractor and Subcontractor that the material submitted is in accordance with the Contract Documents signed and dated.
12. Reports or information requiring certification shall be certified by an authorized officer of the manufacturer or testing agency.
13. Submittals shall include Certified Shop Drawings showing dimensions, loading details, anchor bolt locations, and inserts required for each piece of equipment set on concrete in sufficient time to cause no delay in the Work.
14. Equipment and material submittals shall show sufficient data including all performance data, recommended installation details, and sufficient data to indicate complete compliance with the Contract Documents, including proper sizes, clearances, capacities, materials, and finishes.

C. Required Shop Drawing Submittals:
1. Submittal Shop Drawings, including, but not limited to the following items.
2. Basic Materials and Methods……..See Section 26 00 02.
3. Wire and Cable ..... See Section 26 05 19.
4. Grounding ..... See Section 26 05 26.
5. Raceways..... See Section 26 05 33.
6. Panelboards ..... See Section 26 24 16.
7. Overcurrent Protective Devices ..... See Section 26 28 00.
8. Power Generation ..... See Section 26 32 13.
9. Controls Components ..... See Section 26 90 25.
10. Coordination Drawings as required by this Section.
11. As-Built Drawings.

D. Shop Drawing Submittal Review:
1. Shop Drawings will be reviewed for general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Any action shown in review comments is subject to the requirements of the Contract Documents. The submitting Contractor is responsible for: dimensions that shall be confirmed at the job site; fabrication processes and techniques of construction; coordination of his work with that of all other trades; and the satisfactory performance of his work.

E. Certifications and Test Reports:
1. The Engineer may, at their discretion, witness any or all on and off site acceptance and operational testing. Submit a detailed listing of certification and testing for each system indicating estimated dates for completion of system installation.
2. Test procedures and test result reporting forms shall be submitted for review no later than the date of the certification and testing listing submittal.
3. Submit electronic PDF (coordinate with commissioning requirements) of all certifications and test reports to the Engineer for review adequately in advance of completion of the

Work to allow for remedial action as required to correct deficiencies discovered in equipment and systems.

4. Certifications and test reports to be submitted shall include, but not be limited to those items outlined in Section 26 01 26 - Electrical Testing.
5. Notify the Engineer in writing two (2) weeks prior to all scheduled testing to allow time for Engineer to schedule witnessing of testing, where elected by the Engineer.

1.5 OPERATING AND MAINTENANCE MANUALS

A. Submit electronic PDF of Operating and Maintenance Manuals to the Engineer for approval prior to the beginning of operator training. Provide four approved Operating and Maintenance Manuals for use in operator training. Manuals shall be bound in rigid cover, 3-ring binders with spine and cover labels and shall provide operating and maintenance information for every piece of equipment furnished under this Specification. All sections shall be typed and indexed into sections and labeled for easy reference. Bulletins containing information about equipment that is not installed on the project shall be properly marked up or stripped and reassembled. All pertinent information required by the Owner for proper operation and maintenance of equipment supplied shall be clearly and legibly set forth in memoranda which shall, likewise, be bound with bulletins. As a minimum, the following information shall be provided as applicable:

1. Complete description of each system, item of equipment, and apparatus provided under this Division, including ratings, capacities, performances, data and curves, characteristics identifying name and number, locations, and wiring diagrams, including sources for all parts.
2. Fully detailed parts lists, including all numbered parts and recommended spare parts, of each item of equipment and apparatus provided under this Division.
3. Manufacturer’s printed instructions describing operation, service, maintenance, and repair of each item of equipment and apparatus.
4. Typewritten record of tests made of materials, equipment, and systems included under this Division. Such records shall state the dates the tests were conducted, name(s) of person(s) making and witnessing the tests, and citing any unusual conditions relevant to the tests.
5. Identifying names, name tags designations and locations for all equipment.
6. Fuse and motor heater information including location and use.
7. Equipment and motor nameplate data.
8. Copies of all approved Shop Drawing submittals.
9. Fabrication drawings.
10. Equipment and device bulletins and cut sheets clearly highlighted to show equipment installed on the project and including performance curves and data as applicable.
11. Maintenance instructions clearly highlighted to show all required periodic maintenance and lubrication.
12. Wiring diagrams.
13. Operating instructions clearly highlighted to show proper operating procedures for all equipment.
14. Exploded parts views and parts list for all equipment and devices.
15. Color-coding charts for all painted equipment and conduit.
16. Location and listing of all spare parts and special keys and tools furnished to the Owner.

B. Tools: Provide and deliver to the Owner’s authorized representative any special tools required for maintenance of systems, equipment, and apparatus installed under this Division prior to requesting final acceptance of the installation.

C. Commissioning requirements are part of this contract.

1.6 CODES, PERMITS AND FEES

A. General:

1. Comply with the most recently revised versions of applicable laws, rules, regulations, and ordinances of federal, state, and local utilities and authorities. Where alterations to and deviations from the Contract Documents are required by said authority, report the requirements and secure approval before starting work. Obtain all applicable permits, licenses and inspections and pay all fees charged by above authorities.

B. Code Design Basis:

1. The following codes and ordinances were used in the design of the project and shall be complied with during construction of the project.
   a) Oregon Administrative Rules, as currently adopted,
   b) Electrical Code – NEC, most recent edition adopted,
   c) Oregon Electrical Specialty Code (OESC), as currently adopted,
   d) City of Heppner, OR Building Code, as currently adopted.

C. Precedence:

1. Where Contract Document requirements are in excess of Code requirements and are permitted under the Code, the Contract Documents shall govern. None of the terms or provisions of the drawings or specification shall be construed as waiving any of the rules, regulations or requirements of these authorities. In the event of conflict between the Contract Documents and the local enforcing authority, the latter shall rule. Any modifications resulting there from shall be made without additional cost to the Owner or Engineer. This Contractor shall report any such modifications to the Engineer and secure his approval before proceeding.

1.7 QUALITY ASSURANCE

A. Materials/Methods:

1. Manufacturers, materials and methods described in the various sections of the Specifications, and indicated on the Drawings are intended to establish a standard of quality only. It is not the intention of the Engineer to discriminate against any product, material or method that is equal to the standards as indicated and/or specified, nor is it intended to preclude open, competitive bidding. The fact that a specific manufacturer is listed as an acceptable manufacturer should not be interpreted to mean that the manufacturers standard product would meet the requirements of the project design, Specifications and space constraints.

B. Alternative Products/Materials/Methods:

1. Products by other reliable manufacturers, other materials, and other methods may be accepted provided they have equivalent capacity, construction, and performance. Under no circumstances shall any substitution be made without the prior written approval of the Engineer and acceptance by the City of Heppner and Morrow County.
2. Wherever a definite product, material or method is specified and there is not a statement that another product, material or method will be acceptable, it is the intention of the Engineer that the specified product, material or method is the only one that shall be used without prior approval.

C. Alternative Equipment:

1. Where substituted or alternative equipment is used on the project, it shall be the responsibility of the Contractor or Subcontractor involved to verify that the equipment will fit in the space available, including all required Code and maintenance clearances, and to

coordinate all equipment requirements and provisions with the Electrical Design and all other Contractors.

2. All alternative equipment shall be reviewed and approved by the City of Heppner, Morrow County, and Engineer prior to the procurement or installation of the respective equipment.

D. Compatibility:

1. Provide products that are compatible with other products of the electrical work, and with other work requiring interface with the electrical work, including electrical connections and control devices. For exposed electrical work, coordinate colors and finishes with other work. Determine in advance of purchase that equipment and materials proposed for installation will fit into the confines indicated, leaving adequate clearance as required by applicable codes and for adjustment, repair, and replacement.

1.8 SITE VISIT AND FAMILIARIZATION

A. General:

1. Become familiar with the Drawings and Specifications, examine the premises, and understand the conditions under which the Contract shall be performed, prior to submitting a bid.

B. Site:

1. Be informed of the site conditions, verify locations of new and existing equipment and determine exact requirements for connections.

C. Coordination:

1. Submission of a bid for this project infers that the Electrical Contractor has visited the site and has become familiar with the Drawings and site conditions and has included in his proposal, all work necessary to properly install the systems on the project.

D. Pre-Bid Conference:

1. Refer to Division 1.

1.9 DRAWINGS AND SPECIFICATIONS

A. General:

1. The Drawings are schematic in nature and indicate approximate locations of the electrical systems, equipment, fixtures and devices, except where specific locations are noted and dimensioned on the Drawings. All items are shown approximately to scale. The intent is to show how these items shall be integrated into the project site. Locate all items by on the job measurements and in accordance with the Contract Documents. Cooperate with other trades to ensure project completion as indicated.

B. Location:

1. Prior to locating electrical devices, light fixtures, and other items, obtain the Engineer's approval as to exact location. Locations shall not be determined by scaling Drawings. Mount lighting fixtures and electrical devices at the heights directed by the Engineer. Contractor shall be responsible for costs of redoing work of trades necessitated by failure to comply with this requirement.

2. All electrical devices, lighting fixtures, and other devices shall be referenced to coordinated, established data points and shall be located to present symmetrical arrangements with these points and to facilitate the proper arrangements with respect to the mechanical and electrical outlets and devices. The exact location of each outlet and the arrangements to be followed shall be acceptable to the Engineer.

3. The Drawings show diagrammatically the location of the various outlets and apparatus. Exact locations of these outlets and apparatus shall be determined by reference to the

general Drawings and to all detail Drawings, equipment Drawings, rough-in Drawings, etc., by measurements at the site, and in cooperation with the other trades. The Owner and Engineer reserve the right to make any reasonable change in location of any outlet or apparatus before installation, without additional cost to the Owner.

C. Specifications:
   1. The Specifications are intended to supplement the Drawings and it is not in the scope of the specifications to mention any part of the work that the Drawings are competent to fully explain. Conversely, any part of the work that the specification is competent to fully explain may not be mentioned on the Drawings.

1.10 DISCREPANCIES

A. Clarification:
   1. Clarification shall be obtained before submitting a proposal for the Work under this Division as to discrepancies or omissions from the Contract Documents or questions as to the intent thereof.

B. Detailed Instructions:
   1. Should it appear that the work hereby intended to be done or any of the materials relative thereto is not sufficiently detailed or explained in the Drawings or Specifications, then the Contractor shall apply to the Engineer for such further Drawings or explanations as may be necessary, allowing a 10 working day time period for the Engineer to respond.

C. Interpretations:
   1. Should any doubt or question arise respecting the true meaning of Drawings or Specifications, reference shall be made to the Engineer, whose written decision shall be final and conclusive.

D. Contractor Agreement:
   1. Consideration will not be granted for misunderstanding of the amount of work to be performed. Submission of a bid conveys full Contractor agreement of the items and conditions specified, shown, scheduled, or required by the nature of the project.

1.11 UTILITIES

A. General:
   1. Utility information shown on the Drawings has been shown based upon data obtained from the site survey and the agencies having jurisdiction and are accurate to the best of the knowledge of the Engineer.

B. Coordination:
   1. The Contractor shall be responsible for field verification of the actual location of site and utilities and shall make modifications necessary for connection to or construction around those utilities at no additional cost to the Owner or Engineer.

1.12 TEMPORARY FACILITIES

A. General:
   1. Refer to Uniform General Conditions and Division 1 for requirements concerning temporary electrical facilities.

1.13 SITE OBSERVATION

A. General:

1. Observations at the site to verify general compliance with Contract Documents shall be made periodically by the Engineer or his representative. Written observation comments shall be submitted to the General Contractor for review and a written response.

1.14 COORDINATION OF ELECTRICAL WORK

A. General:

1. Refer to Division 1 for general coordination requirements applicable to the entire work.
2. It is recognized that the Contract Documents are diagrammatic in showing certain physical relationships that must be established within the electrical work and in its interface with other work, including utilities and mechanical work, and that such establishment is the exclusive responsibility of the Contractor. The Drawings show diagrammatically the sizes and locations of the various conduit and raceway systems and equipment items along with the sizes of the major interconnecting distribution, without showing exact details as to elevations, offsets, control lines, and installation details.
3. Arrange electrical work in a neat, well organized manner with services running parallel with primary lines of the building construction and with a minimum of 7’ overhead clearance where possible.
4. The Contractor shall carefully lay out his work at the site to conform to the structural conditions, to avoid obstructions and to provide proper grading of lines. Exact locations of outlets, apparatus and connections thereto shall be determined by reference to detail Drawings, equipment Drawings, etc., by measurements at the site and in cooperation with other Contractors and, in all cases, shall be subject to the approval of the Engineer. Relocations necessitated by the conditions at the site or directed by the Engineer shall be made without any additional cost to the Owner or Engineer.
5. Equipment has been chosen to fit within the available space with all required Code and maintenance clearances and shall be installed as shown. Every effort has been made to also accommodate equipment of other approved manufacturers; however, since equipment and access space requirements vary, the final responsibility for installation access and proper fit of substituted equipment rests with the Contractor.
6. System interferences shall be handled by giving precedence to pipe lines that require a stated grade for proper operation. Where space requirements conflict, the following order of precedence shall, in general, be observed:
    a. Soil and drain piping,
    b. Utility water piping,
    c. Electrical conduit.
7. Locate electrical equipment properly to provide easy access. Arrange entire electrical work with adequate code access for operation and maintenance.
8. Advise other trades of openings required in their work for the subsequent move in of large units of electrical work (equipment).
9. Coordinate all items that will affect the installation of the work of this Division. This coordination shall include, but not be limited to: Voltage, ampacity, capacity, electrical connections, space requirements, sequence of construction, and special conditions.
10. When submitting Shop Drawings on the project, this Contractor is indicating that all necessary coordination has been completed and that the systems, products and equipment submitted can be installed in the building and will operate as specified and intended, in full coordination with all other Contractors and Subcontractors.

1.15 MATERIAL AND WORKMANSHIP

A. General:

1. Materials and equipment shall be new, of best grade and quality, and standard products of reputable manufacturers regularly engaged in the production of such materials and equipment.

B. Workmanship:
1. Work shall be executed and materials installed in accordance with the best practice of the trades in a thorough, substantial, workmanlike manner by competent workmen, presenting a neat appearance when completed.

C. Manufacturer's Recommendations:
1. With exceptions as specified or indicated on the Drawings or in the Specifications, apply, install, connect, erect, use, clean, and condition manufactured articles, materials, and equipment per manufacturer's current printed recommendations. Copies of such printed recommendations shall be kept at the job site and made available as required.

1.16 SPACE REQUIREMENTS

A. General:
1. Determine in advance of purchase that the equipment and materials proposed for installation will fit into the confines indicated, leaving adequate code clearances for adjustments, repair, or replacement.

B. Clearance:
1. Allow adequate space for clearance in accordance with requirements of the Code and local inspection department.

C. Scheduled Equipment:
1. The design shown on the Drawings is based on the equipment scheduled.

D. Responsibility:
1. Since space requirements and equipment arrangement vary for each manufacturer, the responsibility for initial access and proper fit rests with the Contractor.

E. Review:
1. Final arrangement of equipment to be installed shall be subject to the Engineer's review.

1.17 SAFETY REGULATIONS

A. All electrical work shall be performed in compliance with all applicable and governing safety regulations. All safety lights, guards, signs, and other safety materials and provisions required for the performance of the electrical work shall be provided by and operated by the Electrical contractor.

1.18 DELIVERY, STORAGE AND HANDLING OF MATERIALS

A. General:
1. Protect all materials and equipment to be installed under this Division from physical and weather damage.

B. Scope:
1. Work under this Division shall include, but not limited to:
a) Shipping from point of manufacture to job site,
b) Unloading, moving, and storage on site with appropriate protection as required to properly protect equipment from rust, drip, humidity, dust, or physical damage,
c) Hoisting of materials and equipment included in this Division,
d) Ensuring safety of employees, materials, and equipment using such hoisting equipment and scaffolding as is required for safety.

C. Coordination:

1. All large pieces of apparatus which are to be installed on site and which are too large to permit access through gates shall be brought to the job by the Contractor and shall be placed in the spaces before fencing is completed. All apparatus shall be cribbed up from the floor by Contractor and shall be covered with tarpaulins or other protective covering where required for protection.

1.19 NOISE AND VIBRATION

A. General:

1. One year warrants the electrical systems, and their component parts to operate without objectionable noise or vibration. Noise from systems or equipment that results in noise within occupied spaces above the recommended NC curves (refer to ASHRAE Standard) shall be considered objectionable. Vibration shall not be apparent to the senses in occupied areas of adjacent buildings. Objectionable noise, vibration, or transmission thereof to the buildings shall be corrected.

1.20 CLEANING, ADJUSTING, AND START-UP

A. Clean up:

1. The Contractor shall clean away from the job site all debris, surplus material, and similar items, resulting from his work or operations, leaving the job and equipment in a clean condition. The Contractor shall thoroughly clean all pieces of equipment, conduit, boxes, fixtures, and similar items, leaving the installation in a first class condition.

B. Start-up Services:

1. Where specified for any individual item of electrical equipment, provide a factory-authorized representative for testing, start-up of equipment, and instruction of Owner's operating personnel. Certify that these services have been performed by including a properly executed invoice for these services, or a letter from the manufacturer.

C. Lubrication:

1. Provide means for lubricating all bearings and other machine parts. Extend a lubrication tube with suitable fitting to an accessible location and identify it where lubrication fittings are concealed or inaccessible. Lubricate all parts requiring lubrication and keep them adequately lubricated until final acceptance by the Owner.

D. Testing:

1. See Section 26 01 26 – Electrical Testing.

E. Operation Prior to Completion:

1. When any piece of electrical equipment is operable and it is to the advantage of the Contractor to operate the equipment, he may do so, providing that he properly supervises the operation, and has the Engineer's written permission to do so. The warranty period shall, however, not commence until such time as the equipment is operated for the beneficial use of the Owner, or date of substantial completion, whichever occurs first. Regardless of whether or not the equipment has or has not been operated, the Contractor shall properly clean the equipment, properly adjust, and complete all deficiency list items before final acceptance by the Owner. The date of final acceptance and the start of the warranty may not be the same date.

1.21 FINAL REVIEW

A. General:

1. Upon completion of the Work, perform a final test of the entire system.
2. The system shall be operating properly and meet commissioning requirements.

3. After the final test, any changes or corrections noted as necessary for the Work to comply with these Specifications or the Drawings shall be accomplished without delay in order to secure final acceptance of the Work.
4. The date for the final test shall be sufficiently in advance of the Contract completion date to permit execution, before expiration of the Contract, of any adjustments or alterations that the final acceptance tests indicate as necessary for the proper functioning of all equipment. Any such modifications shall be completed within the time allotted for completion of the Contract. Retests shall be conducted as directed and shall be of such time duration as necessary to ensure proper functioning of adjusted and altered items. Retests shall not relieve the Contractor of completion date responsibility.
5. Certificates, including certificates of occupancy from local authorities and documents required herein, shall be completely in order and presented to the Engineer at least one week prior to the review.
6. Individuals knowledgeable of the systems and persons approved by the Engineer shall be present at this final inspection to demonstrate the system and prove the performance of the equipment.

1.22 OPERATION AND MAINTENANCE TRAINING (OWNER INSTRUCTION)

A. General:
   1. The Contractor and appropriate factory-trained representatives shall instruct the Owner's representative in the proper operation and maintenance of all electrical and control systems and equipment, and shall explain all warranties.

B. Training Agenda Outline:
   1. Prior to instruction of Owner Personnel, the Contractor shall prepare a typed outline, listing the subjects that will be included in this instruction, and shall submit the outline for review by the Engineer at least two (2) weeks prior to the time of the training.

C. Training Requirements:
   1. Training shall be provided per the specific requirements in other sections of these specifications. In addition to training required in other sections of the specifications, the Contractor shall conduct specifically organized training sessions in the overall operation and maintenance of the electrical and control system for personnel employed by the Owner. The training sessions shall be conducted to educate and train the personnel in operations and maintenance of all components of the electrical system outside the training requirements in the other Sections.
   2. Training shall include, but not be limited to, the following:
      a) Preventative maintenance procedures,
      b) Trouble-shooting,
      c) Calibration,
      d) Testing,
      e) Replacement of components,
      f) Equipment operation.
   3. At a minimum, one training session, at least 4 hours in duration, shall be conducted at the facility after start-up of the electrical and control systems. The Contractor shall prepare and assemble specific instruction materials for each training session and shall supply such materials to the Owner at least two (2) weeks prior to the time of the training.

D. Certification:
   1. At the conclusion of the instruction period, the Contractor shall obtain the signature of each person being instructed on each copy of the approved training outline to signify that the personnel has a proper understanding of the operation and maintenance of the systems, and resubmit the signed outlines.

E. Other Requirements:
   1. Refer to other Division 26 Sections for additional Operator Training requirements for specific pieces of equipment or specific systems.
   2. The Contractor shall coordinate the Operator Training requirements listed above with the Owner Instruction requirements of Division 1.

1.23 CONTRACTOR WARRANTIES AND GUARANTEES

A. General:
   1. Contractor shall guarantee all material and equipment installed by him against defects in workmanship and material for a period of 12 months after final acceptance of the work by the Owner. He shall repair or replace any materials or equipment developing such defects within that time promptly on due notice given him by the Owner and at Contractor's sole cost and expense.

B. Equipment:
   1. All equipment bearing a manufacturer's guarantee, such as electrical equipment, devices, components, and similar items, shall be construed to have an extended guarantee to the Owner by the manufacturer. Any such equipment that proves defective in materials or workmanship within the guarantee period is to be replaced by the Contractor in accordance with the manufacturer's guarantee.

PART 2 PRODUCTS

2.1 NOT USED.

PART 3 EXECUTION

3.1 NOT USED.

END OF SECTION

SECTION 26 00 01
ELECTRICAL SCOPE OF WORK

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Project Description

B. Electrical Scope of Work

1.2 DESCRIPTION OF WORK

A. This project includes, but is not limited to, the supply and installation of a new standby power system, power distribution equipment, alarm autodialer, equipment rack, along with other ancillary site hardware and equipment meeting the City of Heppner, Morrow County, and Oregon Emergency Operations Management requirements.

B. Provide labor, materials, tools, machinery, equipment, devices, and services necessary to complete the specified work of this and all other Divisions. Coordinate work with other trades to prevent conflicts without impeding job progress.

C. The scope of work generally includes, but is not limited to, the following:
   1. Revised electrical service,
   2. Propane tank, hardware, and connections,
   3. Standby propane generator and automatic transfer switch,
   4. Power distribution equipment,
   5. Cellular alarm autodialer,
   6. Electrical equipment rack and concrete pads,
   7. Ancillary accessories, hardware, and appurtenances for a complete and usable standby power system.

D. Project work includes, but is not limited to:
   1. A complete power distribution system including, but not limited to:
      a) Service entrance equipment,
      b) Panelboard,
      c) Cable feeders,
      d) Overcurrent devices,
      e) Raceways,
      f) All other components shown on the Drawings, specified, or required for a fully operational system.
   2. A complete grounding system including, but not limited to:
      a) Ground rods,
      b) Bonding,
      c) Ground conductors,
      d) Raceways,
      e) All other components shown on the Drawings, specified or required for a fully operational system.
   3. A complete branch circuit distribution system including, but not limited to:
      a) Branch and circuit wiring,
      b) Raceways,
      c) Wiring devices,

d) Controls,
e) Connections to motors and equipment,
f) All other components shown on the Drawings, specified, or required for a fully operational system.

4. A complete system of miscellaneous electric controls and control wiring as shown on the Drawings and specified.
5. A complete standby emergency power system including, but not limited to:
   a) Propane emergency generator,
   b) Propane tank and fuel supply hardware,
   c) Automatic transfer switch,
   d) Controls,
   e) Cellular alarm autodialer,
   f) Power distribution,
   g) Overcurrent protection,
   h) All other components shown on the Drawings, specified or required for a fully operational system.
6. Electrical testing and certification as specified.
7. Concrete housekeeping pads, and other supports as required for electrical equipment and components.
8. Connections to equipment furnished by the General Contractor or other Divisions.
9. Additional items as shown on the Drawings or specified.

1.3 RELATED SECTIONS

A. Related Sections include but are not necessarily limited to:
   1. Section 26 00 00 – Electrical General Provisions
   2. Section 26 00 02 – Basic Materials and Methods
   3. Section 26 01 26 – Electrical Testing
   4. Section 26 05 19 – Wire and Cable
   5. Section 26 05 26 – Grounding
   6. Section 26 05 33 – Raceways
   7. Section 26 24 16 – Panelboards
   8. Section 26 27 13 – Service and Metering
   9. Section 26 28 00 – Overcurrent Protective Devices
   10. Section 26 32 13 – Power Generation
   11. Section 26 90 25 – Control Components

PART 2 PRODUCTS

2.1 GENERAL

A. Refer to specific Sections of the Specification for equipment.

PART 3 EXECUTION

3.1 GENERAL

A. Installation shall be in accordance with the Specification section pertaining to the individual Equipment.

END OF SECTION

SECTION 26 00 02
BASIC MATERIALS AND METHODS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Basic requirements for electrical systems, including but not limited to:
   1. Manner of running conduits
   2. Hangers and supports
   3. Attachment
   4. Openings, cutting, and patching
   5. Excavation, trenching, and backfilling
   6. Cleaning and painting of electrical work
   7. Electrical system identification
   8. Warning signs and operational tags
   9. Prohibited markings
   10. Equipment housekeeping pads and anchor bolts
   11. Wiring device and equipment mounting heights

1.2 DESCRIPTION OF WORK

A. This section covers the basic materials and methods of electrical construction as shown, scheduled, indicated, and specified.

1.3 DEFINITIONS

A. For the purposes of providing materials and installing electrical work, the following definitions shall be used:
   1. Outdoor Area: Exterior locations where the equipment is normally exposed to the weather and including below grade structures, such as vaults, manholes, handholes and in-ground pump stations.
   2. Shop Fabricated: Manufactured or assembled equipment for which a UL test procedure has not been established.

1.4 RELATED SECTIONS

A. Related Sections include but are not necessarily limited to:
   1. Section 26 00 00 – Electrical General Provisions
   2. Section 26 00 01 – Electrical Scope of Work
   3. Section 26 01 26 – Electrical Testing
   4. Section 26 05 19 – Wire and Cable
   5. Section 26 05 26 – Grounding
   6. Section 26 05 33 – Raceways
   7. Section 26 24 16 – Panelboards
   8. Section 26 27 13 – Service and Metering
   9. Section 26 28 00 – Overcurrent Protective Devices
   10. Section 26 32 13 – Power Generation
   11. Section 26 90 25 – Control Components

1.5 STANDARDS AND REFERENCES

A. American National Standards Institute (ANSI):
   1. C2, National Electrical Safety Code
   2. Z535.1, Safety Color Code
   3. Z535.2, Environmental and Facility Safety Signs
   4. Z535.3, Criteria for Safety Symbols
   5. Z535.4, Product Safety Signs and Labels.

B. National Fire Protection Association (NFPA):
   1. 70, National Electrical Code (NEC)
   2. 70E, Standard for Electrical Safety in the Workplace
   3. 79, Electrical Standard for Industrial Machinery
   4. 820, Standard for Fire Protection in Wastewater Treatment and Collection Facilities

C. Occupational, Health and Safety Administration (OSHA):
   1. 1910.145, Specification for Accident Prevention Signs and Tags

D. Oregon Occupational, Health and Safety Administration (O-OSHA)

E. Oregon Electrical Specialty Code (OESC)

F. All materials and equipment specified herein shall fall within the scope of UL Examination Services, be approved by the Underwriter's Laboratories for the purpose for which they are used and shall bear the UL label.

1.6 SUBMITTALS

A. Shop Drawings
   1. See Section 26 00 00.
   2. The Contractor shall submit to the Engineer, for review, a list of proposed manufacturers and product data on supports, and methods of attachment to the structure.
   3. Excavation and trenching plan, designed and sealed by a registered professional engineer.

1.7 DELIVERY, STORAGE, AND HANDLING

A. See Section 26 00 00.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Refer to specific Division 26 sections and specific material paragraphs below.

B. Provide all components of a similar type by one manufacturer.

2.2 ELECTRICAL EQUIPMENT SUPPORTS

A. Approved manufacturers:
   1. Unistrut Building Systems
   2. B-Line
   3. Globe Strut

B. Material requirements:

1. Galvanized steel: ASTM A123 or ASTM A153
2. Stainless steel: AISI Type 316
3. PVC coated galvanized steel: ASTM A123 or ASTM A153 and 20 mil PVC coating

2.3 NAMEPLATES

A. For labeling equipment enclosures and equipment that is visible with the enclosure door closed:
   1. Approved manufacturers catalog numbers:
      a) W. H. Brady Co., #B-1.
      b) Seton, “Setonply”.
   2. Materials: Phenolic, 2-ply engraved.
   3. Size:
      a) Surface: As required for the text.
      b) Thickness: 1/16 IN.
   4. Fabrication:
      a) Two layer laminated.
      b) Legend engraved through top lamination into bottom lamination.
      c) Drilled holes in each corner, for screw mounting.
   5. Colors: Black top surface, white core, unless otherwise indicated.
   6. Fasteners: Self-tapping stainless steel screws.

B. For labeling components inside equipment enclosures:
   1. Approved manufacturers catalog numbers:
      a) W. H. Brady Co., “Industrial Strength Tape” #42018
      b) Seton, “Component and General Identification Labels” #45553
      c) Panduit, “Standard Labeling Tape” LS4-33
   2. Materials: Vinyl tape or vinyl cloth with printable topcoat.
   3. Colors: White background, black printing.

2.4 WIRE MARKERS

A. For control panels, electrical gear, pull and junction boxes:
   1. Material: vinyl or polyester tape.
   2. Approved manufacturer's catalog numbers:
      a) W. H. Brady Co., Indoor/Outdoor Vinyl Tape, B-580
      b) Seton, “Self-Laminating Wire Marker Labels” M7340
      c) Panduit, LS4M “Industrial Labeling Tape”
   3. Material: Heat shrinkable polyolefin.
   4. Approved manufacturer's catalog numbers:
      a) Seton, Welded Wire Marking Sleeves
   5. Colors: White background, black printing.

B. Conduit tags for manholes, handholes and exterior pad mounted electrical gear:
   1. Material: Aluminum or stainless steel.
   2. Approved manufacturer's catalog numbers:
      a) Panduit META-X or META54-X
   3. Legend: Embossed.
   4. Fasteners: Stainless steel.

2.5 SAFETY SIGNS

A. Approved manufacturers catalog numbers:
   1. W. H. Brady Co., #B-302 or #B-120
   2. Seton, Pressure Sensitive Vinyl or Tedlar Coated Plastic
   3. Panduit, GMM Polyester Film (Type PPS) or GMPE1 Rigid Polyethylene (Type PRS)

B. Materials, size and fabrication:
   1. For outdoor use: Fiberglass or coated plastic, surface area as required by the text, minimum area 7 x 10 IN, 60 mil thickness, drilled holes for screw mounting.

C. Color in accordance with ASME (ANSI Z535.1, .2, .3 and .4) and OSHA 1910.145.

D. Minimum letter size on indoor signs, 3/16 in.

E. Maximize the letter size on outdoor signs to sufficiently fill the printable area on the sign.

F. Standards: ASME/ANSI Z535.1, Z535.2, Z535.3 and Z535.4, OSHA 1910.145.

PART 3 EXECUTION

3.1 MANNER OF RUNNING CONDUITS

A. All conduits shall be concealed unless otherwise indicated.

B. Conduit may be run exposed but only where necessary. All exposed conduit shall be run in the neatest, most inconspicuous manner, and parallel or perpendicular to the building or site lines.

C. All conduit and surface raceways shall be adequately and properly supported from the rack structure by means recommended by the manufacturer, or by the use of clamps as herein specified.

D. Run conduit to avoid proximity to heat producing equipment, piping and flues, keeping a minimum of 8" clear.

E. Whenever possible, install horizontal conduit runs above water piping.

F. Install all conduit to allow for adequate maintenance and access clearances to all equipment.

G. The Contractor shall study all construction documents and carefully lay out all work in advance of fabrication and erection in order to meet the requirements of limited spaces. Where conflicts occur, the Contractor shall meet with all involved trades and the Construction Inspector and resolve the conflict prior to erection of any work in the area involved.

H. Conduit and raceway connections, rough-in, and stub-up locations for equipment shall be coordinated by the Contractor to provide locations in locations indicated on approved manufacturers equipment shop drawings. Connection, rough-in and stub-up locations shown on the Drawings are diagrammatic for general reference only.

3.2 HANGERS AND SUPPORTS

A. All supports required for the proper installation of equipment, and conduit shall be provided as hereinafter specified unless otherwise indicated on the Drawings.

B. All conduits shall be supported as specified in Section 26 05 33, unless specifically noted differently on the Drawings or in the Specifications, but in every case shall be adequate to support the raceway being suspended. The supports shall be from the structure to line of grade, with proper provision for expansion, contraction, vibration elimination, and anchorage.

C. Vertical conduits shall be supported from floor lines with riser clamps sized to fit the conduit and to adequately support their weight, with allowance for expansion and contraction. At the

bases of conduit, where required for proper support, provide anchor base fittings or other approved supports.

D. Conduit shall not be supported from ductwork, piping, or equipment.

E. All electrical conduits and surface raceways exposed to view shall be run parallel to the adjacent structure construction.

F. Single conduits running horizontally shall be supported by Caddy, Minerallac, or approved equal. Refer to Section 26 05 33 for additional requirements.

G. Channels shall be as manufactured by Unistrut, Superstrut, Kindorf, or approved equal. Conduits shall be secured to the channel with stainless steel clamps. Refer to Section 26 05 33 for additional requirements.

H. Vertical conduits, both concealed and exposed, shall be supported by clamping to vertical surfaces or by means of clamps as required by the installation. Refer to Section 26 05 33 for additional requirements.

I. Conduits and raceways run against surfaces shall be supported by means recommended by the manufacturer, or by means of single or two-hole rigid conduit clamps. Two-hole clamps shall be provided where size of conduit and installation conditions warrant Refer to Section 26 05 33 for additional requirements.

J. All auxiliary steel required for conduit, supports, etc. shall be provided by the Electrical Trades unless specifically indicated to be provided by others. All support steel and fasteners shall be stainless steel.

K. Contractor shall review all Drawings, including Structural Drawings, for details regarding supports.

L. All supports shall be of type and arrangement to prevent excessive deflection, to avoid excessive bending stresses between supports, and to eliminate transmission of vibration.

M. Perforated strap shall not be used as a hanger material.

3.3 ATTACHMENT

A. All conduits not embedded in concrete shall be securely and independently supported so that no strain will be transmitted to outlet box and supports, etc. Supports shall be rigid enough to prevent distortion of conduits during wire pulling.

B. Inserts shall be of a type which will not interfere with reinforcing, and which will not displace excessive amounts of structural concrete. All methods of attachment to the structure and the use of after-set inserts shall be approved in writing by the Engineer.

C. All conduit and equipment supports shall be designed and installed to avoid interference with other piping, ducts, conduit, supports, structures, equipment, etc. All conduit shall be installed with due regard to expansion and contraction and the method of support, location of support, etc. shall be governed in part by this Specification.

D. Fastening of conduits, etc., shall be as follows: To steel – machine – screws or welding (when specifically permitted or directed), or bolts, and to concrete by suitable inserts anchored to reinforcing steel, and poured in place unless other means are indicated on the plans. Power-actuated fasteners (shooting) will not be acceptable under any circumstances unless approved by the Engineer in writing.

3.4 OPENINGS, CUTTING AND PATCHING

A. General:

1. The Contractor shall be responsible for coordinating openings for installation of electrical systems. Comply with the requirements of Division 1 for other work to accommodate the

installation or electrical work. Except as individually authorized by the Engineer, cutting and patching of electrical work to accommodate the installation of other work is not permitted.

B. Methods or Cutting:

1. Openings cut through concrete shall be made with masonry saws and/or core drills and at such locations acceptable to the Engineer. Impact-type equipment may be used upon written approval of the Engineer. Openings in pre-cast concrete slabs for conduits, outlet boxes, etc., shall be core drilled to exact size.

C. Approval:

1. If holes or sleeves are not properly installed and cutting and patching becomes necessary, it shall be done at no change in Contract amount. Undertake no cutting or patching without first securing written approval from the Engineer. Patching shall create a surface which is structurally and aesthetically equal to the surface surrounding the area patched and shall be performed by the trade whose work is involved at no change in the Contract amount.

D. Protection:

1. Any openings through walls below grade shall be properly protected to prevent entrance of water or other damaging elements.

E. Special Note:

1. No coring, boring, or excavating which will weaken any structure shall be undertaken.

3.5 EXCAVATING, TRENCHING AND BACKFILLING

A. General:

1. The work hereunder includes whatever excavating and backfilling is necessary to install the electrical work. Coordinate the electrical work in the same area, including excavating and backfilling, dewatering, floor protection provisions, other temporary facilities needed for protection and proper performance of excavating and backfilling.

B. Standards:

1. Except as otherwise indicated, comply with the applicable provisions of Division 2 for electrical work excavating and backfilling. Refer instances of uncertain applicability to the Engineer for resolution before proceeding with the Work.

C. The bottoms of trenches shall be excavated to required depths, slope and grade. The bottom of the trench shall be accurately excavated to provide firm, uniform bearing for the bottom of the raceways and duct-banks. Where mud or unstable soil is encountered in bottom of trench, it shall be removed to firm-bearing and the trench shall be back filled with bedding sand to proper grade and tamped to provide uniform firm support.

D. The bottom of trenches shall be accurately graded to provide proper fall and uniform bearing and support for each section of the conduit on undisturbed soil or 2" of sand fill at every point along its entire length.

E. Exercise care not to excavate below required depth, leaving a flat bed of undisturbed earth; firm and secure before laying cable and duct-banks. In the event rock is encountered, excavate 6" below required depth and backfill to required depth with bedding sand, and compact to minimum 95% compaction.

F. All grading in the vicinity of excavation shall be controlled to prevent surface ground water from flowing into the excavations. Any water accumulated in the excavations shall be removed by pumping or other acceptable method. During excavation, material suitable for backfilling shall be stacked in an orderly manner a sufficient distance back from edges of trenches to avoid overloading and prevent slides or cave-ins. Material unsuitable for backfilling shall be wasted and removed from the site and properly disposed of.

G. The Contractor shall be fully responsible for the safety of persons, materials and equipment in or near trenches or other excavations and provide all required sloping, shoring, railings and other protective provisions.

H. If any unknown and/or uncharted utilities are encountered during excavation, promptly notify Engineer and wait for his/her instruction before proceeding,

I. If such unknown utilities are encountered and work is continued without contacting the Engineer for instructions, and damage is caused to said utilities, the Contractor shall repair at his own expense, such damage to the satisfaction of the owner or utility company concerned.

J. Trenches shall not be backfilled until all required tests have been made by the Contractor and approved by the Engineer and any local authorities having jurisdiction.

K. Backfill shall be compacted or cement stabilized sand up to 6" above the top of conduit. Backfill up to grade shall be in maximum 6" lifts with minimum 95% compaction of lifts. Refer to Division 2 or elsewhere in Contract Documents for additional trenching and backfill requirements.

L. Excavation in Vicinity of Trees:

1. All trees, including low hanging limbs within the immediate area of construction, shall be adequately protected to a height of at least 5' to prevent damage from the construction operations and/or equipment. All excavation within the outermost limb radius of all trees shall be accomplished with extreme care. All roots located within this outermost limb radius shall be brought to the attention of the Engineer before they are cut or damaged in any way. The Engineer will give immediate instructions for the disposition of same. All stumps and roots encountered in the excavation that are not within the outermost limb radius of existing trees shall be cut back to a distance of not less than 18" from the outside of any concrete structure or pipeline. No chips, parts of stumps, or loose rock shall be left in the excavation. Where stumps and roots have been cut out of the excavation, clean, compacted, dry bank sand shall be backfilled and tamped.

3.6 CLEANING AND PAINTING OF ELECTRICAL WORK

A. Prime, protective touch-up painting is included in the Work of this Division. Finish painting in equipment spaces, concealed locations, and other locations not exposed to the view of building occupants is included in the work of this Division. Finished painting in areas exposed to the view of building occupants is specified under Division 9.

B. All equipment and materials furnished by the electrical subcontractor shall be delivered to the job with suitable factory finish.

C. Electrical equipment with suitable factory-applied finishes shall not be repainted; except for aesthetic reasons as directed by the Engineer and in a color selected by the Engineer. Where factory-applied finishes are damaged in transit, storage or installation; or before final acceptance, they shall be restored to factory-fresh condition by competent refinishers using the spray process.

D. All equipment not finished at the factory shall be given a prime coat and then finish painted with two coats of enamel in color as directed by the Engineer. No nameplates on equipment shall be painted, and suitable protection shall be afforded such plates to prevent their being rendered illegible during the painting operations.

E. The surfaces finish-painted shall first be prepared as follows:

1. Galvanized and black steel surfaces shall first be painted with one coat of galvanized metal primer.
2. Aluminum surfaces shall first be painted with one coat of zinc chromate primer.

F. All ferrous metal surfaces without protective finish and not galvanized, in exposed and concealed areas shall be painted with two coats of zinc chromate primer as the construction progresses to protect against deterioration.

G. Before painting, all surfaces to be painted shall be suitably prepared. This shall include removing all oil, rust, scale, dirt, and other foreign material. Surfaces shall be made smooth by grinding, filing, brushing, or other approved method. In the painting operations, the primer for metal surfaces shall be of the zinc dust type unless specified otherwise, and where finish painting is specified, it shall be painted using materials and colors selected and approved by the Engineer. Refer to Division 9 for additional requirements.

3.7 WARNING SIGNS AND OPERATIONAL TAGS

A. Warning Signs: Provide warning signs where there is hazardous exposure associated with access to or operation of electrical facilities. Provide text of sufficient clarity and lettering of sufficient size to convey adequate information at each location; mount permanently in an appropriate and effective location. Comply with recognized industry standards for color and design.

B. Operational Tags: Where needed for proper and adequate information on operation and maintenance of electrical systems, provide tags of plasticized card stock, either preprinted or hand printed.

C. Available short circuit current shall be affixed via nameplate to the main service disconnect enclosure. Coordinate with Avista at the time of service energization for the final available current to the disconnect.

3.8 EQUIPMENT HOUSEKEEPING PADS AND ANCHOR BOLTS

A. Concrete pads for electrical equipment (Housekeeping Pads) will be furnished under this Division.

1. All concrete used shall be 5 sack mix with 1/2" maximum aggregate and 4000 psi compressive strength when tested after 28 days in accordance with ASTM 039-44, "Standard Method of Test for Compressive Strength of Concrete".
2. Equipment rack supports shall be formed using Sonatube or an approved equal forming system.
3. Keep concrete wet at least 48 hours after forms are removed to ensure proper curing.
4. Equipment pads shall be reinforced where noted on the Drawings.

B. Pads shall be nominal 6" high and shall extend a minimum of 12" beyond all equipment and supports while generally conforming to the shape of the equipment.

C. Furnish galvanized anchor bolts with layout templates for installation in equipment pads. Bolts shall be of the size and quantity recommended by the manufacturer and where vibration isolators are used, they will be anchor bolted to the equipment pad.

3.9 WIRING DEVICE AND EQUIPMENT MOUNTING HEIGHTS

A. In general, unless noted otherwise on Architectural or Electrical Drawings, mounting heights to device centerline shall be as follows:

Panelboards	72" from finished slab to top of panel board.

END OF SECTION

SECTION 26 01 26
ELECTRICAL TESTING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Material and installation requirements for:
   1. Testing of electrical systems.

1.2 DESCRIPTION OF WORK

A. Provide testing of electrical work installed under Division 26, as specified herein and in other Division 26 sections. Feeders and equipment shall not be placed in service until they have been checked and tested, as applicable.

1.3 RELATED SECTIONS

A. Related Sections include but are not necessarily limited to:
   1. Section 26 05 19 – Wire and Cable
   2. Section 26 05 26 – Grounding
   3. Section 26 32 13 – Power Generation
   4. Section 26 90 25 – Control Components

1.4 STANDARDS AND REFERENCES

A. All materials and equipment specified herein shall, within the scope of UL Examination Services, be approved by the Underwriter's Laboratories for the purpose for which they are used and shall bear the UL label.

B. All materials and equipment specified herein shall conform with all applicable NEMA, ANSI and IEEE Standards

C. All materials and equipment specified herein and their installation methods shall conform to the latest published version of the National Electrical Code, NEC and meet the City of Hayden, Idaho, Sewer and Pump Station Policies and Procedures as currently adopted.

1.5 SUBMITTALS

A. Shop Drawings
   1. See Section 26 00 00.

B. Testing Procedures: Submit proposed testing procedures to the Engineer for review at least 10 working days prior to conducting any testing on the project.

C. Reporting Forms: Submit proposed forms to be used in recording testing data and results to the Engineer for review at least 10 working days prior to conducting any testing on the project.

D. Calibration List: Submit a listing of testing devices to be used for the project to the Engineer for approval. Listing shall include documentation that the devices are properly calibrated.

E. Test Log: The Contractor shall maintain a test log at the site to document the results of all successful and unsuccessful testing as it is performed. This log shall be available for review by the Engineer and a copy of the log shall be submitted to the Engineer prior to the Substantial Completion inspection. A space shall be provided on the test log signoff by the Engineer or Owners representative.

F. Test Data and Results: Submit complete data and certified test results for each test performed, including, but not limited to:
   1. Test performed,
   2. Test procedure,
   3. System and area tested,
   4. Date(s) and time(s) of test,
   5. Weather conditions,
   6. Test criteria,
   7. Test results,
   8. Additional pertinent information.

G. Testing Certification: Certifications stating that submitted test data and results are true and correct shall be provided for all submittals under this section. Certification shall be executed by an authorized officer if the Contractor is a corporation, by a partner if the Contractor is a partnership, by the owner if the Contractor is a sole proprietorship or by the authorized representative if the Contractor is a joint venture.

H. Operational Certification: For Packaged, Vendor Supplied, Custom Engineered, systems or equipment submit an operational certification which documents that all equipment and systems have been fully tested to verify proper operation in accordance with the design shown in the Contract documents and manufacturer's recommendations.

1.6 NOTICE

A. Notify the Engineer in writing 10 working days prior to all scheduled testing to allow time for Engineer to schedule witnessing of testing, where elected by Engineer.

PART 2 PRODUCTS

2.1 TESTING MATERIALS

A. General: Provide all materials and test equipment required for testing of specified electrical systems, including re-testing until acceptable results are obtained.

B. Products: Tested products which fail to provide acceptable test results shall be repaired or replaced with suitable materials as required to obtain acceptable results.

PART 3 EXECUTION

3.1 TESTING

A. General: Tests shall be made during the course of the construction as specified and as required by authorities having jurisdiction. Such test shall be conducted by this Division as part of the Work and shall include all personnel, material, and equipment required to perform test until satisfactory results are obtained. Any defects detected during testing shall be satisfactorily repaired or the equipment involved shall be replaced and the test re-executed.

B. Testing shall include but not be limited to all items in other Sections of this Division and the following:
   1. Feeders: Refer to Section 26 05 19.
   2. Ground Rods: Refer to Section 26 05 26.
   3. Instrumentation and Control Components: Refer to Section 26 90 25.

C. Test Reports (Attached)

1. ELECTRICAL SYSTEM TEST REPORT - 600V CABLE
2. ELECTRICAL GROUND ROD TEST REPORT

END OF SECTION

26 01 26 ELECTRICAL SYSTEM TEST REPORT - 600V CABLE

ELECTRICAL SYSTEM
DESCRIPTION DATA

SERVICE DESCRIPTION:
nominal voltage, phase to phase
phase to neutral - single or three phase-
number of conductors _____

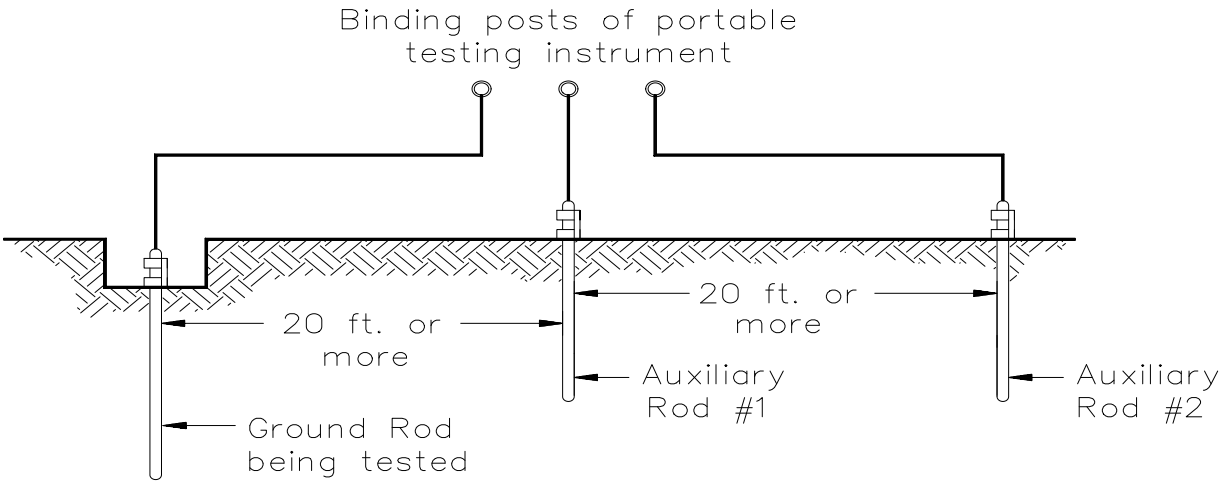
SERVICE CONDUCTORS:
phase size and insulation type _____
neutral size and insulation type _____
ground size and insulation type _____

SERVICE DISCONNECT DESCRIPTION:
circuit breaker or disconnect switch _____
size (amps) _____
fuse (amps) _____

MEASURED CONDITIONS		DATA
Operating Load Voltage	Volts	Vab_____Vbc_____Vca_____
		Van_____Vbn_____Vcn_____
Operating Load Feeder Current	Amps	Ia_____Ib_____Ic_____
Conductor Insulation Resistance - record the measurement for each set of conductors in a single raceway for the following circuits:	Megohms	a-b_____b-c_____c-a_____
	Megohms	a-g_____b-g_____c-g_____

1. Service Feeder
2. Generator Feeder
3. Bartholomew Bldg. Feeder

26 01 26 - ELECTRICAL GROUND ROD TEST REPORT



GROUND ROD RESISTANCE TESTING

PROCEDURE:
To measure ground resistance, two additional temporary grounds, consisting of short rods 2 or 3 feet long, shall be driven in the ground at least 20 feet away from the rod being tested. A direct-reading ground resistance tester shall then be connected to the three ground rods by means of insulated leads. The battery operated ground resistance tester reads the resistance of the ground rod being tested directly in ohms. The ground rod location / designation and its measured ohm value shall be recorded in chart below.

GROUND ROD LOCATION / DESIGNATION	OHM VALUE
1.	*
2.	*
3.	*
COMPOSITE GROUND	*

*Ohm value of a single ground rod shall not exceed 25 Ohms. If additional ground rod(s) are added, the "composite" ground electrode shall have a maximum acceptable reading of 15 Ohms which shall be recorded in chart above.

SECTION 26 05 19
WIRE AND CABLE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Material and installation requirements for:
   1. Power and control cable
   2. Data cable
   3. Wire connectors
   4. Insulating tape

1.2 DESCRIPTION OF WORK

A. Provide electrical wiring and connections as shown, scheduled, indicated, and specified.

B. All wiring shall be in raceways.

1.3 RELATED SECTIONS

A. Related Sections include but are not necessarily limited to:
   1. Section 26 00 00 – Electrical General Provisions
   2. Section 26 00 01 – Electrical Scope of Work
   3. Section 26 00 02 – Basic Materials and Methods
   4. Section 26 01 26 – Electrical Testing
   5. Section 26 05 26 – Grounding
   6. Section 26 05 33 – Raceways
   7. Section 26 24 16 – Panelboards
   8. Section 26 27 13 – Service and Metering
   9. Section 26 28 00 – Overcurrent Protective Devices
   10. Section 26 32 13 – Power Generation
   11. Section 26 90 25 – Control Components

1.4 STANDARDS AND REFERENCES

A. All materials and equipment specified herein shall, within the scope of UL Examination Services, be approved by the Underwriter's Laboratories for the purpose for which they are used and shall bear the UL label.

B. Products shall be designed, manufactured, tested, and installed in compliance with the following standards:
   1. Insulated Cable Engineers Association:
      a) S-58-679, Control Cable Conductor Identification
   2. Institute of Electrical and Electronic Engineers (IEEE):
      a) 518, Guide for the Installation of Electrical Equipment to Minimize Electrical Noise Inputs to Controllers from External Sources
   3. National Electrical Manufacturers Association (NEMA):
      a) ICS 4, Terminal Blocks for Industrial Use
   4. National Electrical Manufacturers Association/Insulated Cable Engineers Association (NEMA/ICEA):

a) WC 70/ICEA S-95-658, Standard for Nonshielded Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy

5. National Fire Protection Association (NFPA):
   a) 70, National Electrical Code (NEC)
   b) 262, Method of Test for Fire and Smoke Characteristics of Wires and Cables.
6. Underwriters Laboratories, Inc. (UL):
   a) 44, Thermoset-Insulated Wires and Cables
   b) 83, Thermoplastic-Insulated Wires and Cables
   c) 467, Grounding and Bonding Equipment
   d) 486A, Wire Connectors and Soldering Lugs for use with Copper Conductors
   e) 486C, Splicing Wire Connectors
   f) 510, Insulating Tape
   g) 1581, Reference Standard for Electrical Wires, Cables, and Flexible Cords

C. All materials and equipment specified herein and their installation methods shall conform to the latest published version of the National Electrical Code, NEC and meet the City of Hayden, Idaho, Sewer and Pump Station Policies and Procedures as currently adopted.

1.5 DEFINITIONS

A. Cable: Multi-conductor, insulated, with outer sheath containing either building wire or instrumentation wire.

B. Instrumentation Cable: Multiple conductor, insulated, twisted or untwisted, with outer sheath. The following are specific types of instrumentation cables:
   1. Analog signal cable: Used for the transmission of low current (e.g., 4-20mA DC) or low voltage (e.g., 0-10 V DC) signals, using No. 16 AWG and smaller conductors. Commonly used types are defined in the following:
      a) UTP: Unshielded twisted pair,
      b) TSP: Twisted shielded pair, (or STP: Shielded twisted pair),
      c) TST: Twisted shielded triad.
   2. Digital signal cable: Used for the transmission of digital signals between computers, PLC's, RTU's, etc.

C. Power Cable: Multi-conductor, insulated, with outer sheath containing building wire, AWG No. 8 and larger.

D. Control Cable: Multi-conductor, insulated, with outer sheath containing building wires, AWG No. 16, AWG No. 14, AWG No. 12 or AWG No. 10.

E. Building Wire: Single conductor, insulated, with or without outer jacket depending upon type.

1.6 SUBMITTALS

A. Shop Drawings
   1. See Section 26 00 00.

PART 2 PRODUCTS

2.1 CONDUCTORS

A. Conductors shall be stranded aluminum (Service and Bldg. Feeder) or copper (All other). Sizes AWG No. 14, 12 and 10 for general purpose lighting and receptacle wiring and all wiring within circuit breaker panels may be solid. All other conductors shall be stranded. Insulation shall be THW-2, THWN-2, or THHN, XHHW, (90˚F) chosen to satisfy

environmental conditions. Conductors used for power circuits shall not be smaller than AWG No. 12. Control conductors may be AWG No. 14.

2.2 CONNECTORS

A. Ideal Industries “Wing Nut” or 3M Company “SCOTCHLOCK” pre-insulated connectors may be used for lighting and receptacle circuits for splices and taps in conductors AWG No. 10 and smaller. For AWG No. 8 and larger conductors, utilize Thomas & Betts compression connectors. Compress using recommended die and tools.

B. For connections of wire to cord to removable equipment provided with integral cords (such as floats, transducers, etc.) provide junction box with terminals and coat with liquid insulation.

C. For connections of wire to cord for submersible motors of all size wire use a water proof motor stub insulator: Thomas & Betts multi splice insulator MSLT112-4 or equal.

2.3 DATA COMMUNICATIONS CABLE (UTP)

A. Data communications cable shall be four pair unshielded twisted pair, AWG No. 23 copper. Cable shall be enhanced EIA/TIA category 6 cable.

B. Cable shall be used for short haul applications of 100 meters or less between devices, unless approved by Engineer.

C. Acceptable Manufacturers:

		APPLICATION
	Manufacturer:	Indoor/Outdoor
1.	CommScope	CS34P-IO

D. Final termination shall be by the County IT Department. All cables to be routed, provisioned, and ready for termination by the County in the IT/Communications room of the Bartholomew Building basement.

PART 3 EXECUTION

3.1 GENERAL

A. Splicing of power and control and signal wires or cables is not allowed. All wire transitions shall be done on terminals.

B. Keep all conductors within the allowable tension limits during installation. Lubricants for wire pulling, if used, shall be approved for the insulation and raceway material. Observe cable manufacturer's and industry standard cable bending radius recommendations.

C. Incoming conductors in panelboards, control panels, etc., AWG No. 6 and smaller, shall be bundled and laced at intervals not greater than 6 inches and neatly spread into trees and connected to their respective terminals.

D. Sufficient slack shall be allowed in conductors for alterations in terminal connections. Lacing shall be done with plastic cable ties using a tensioning tool designed for that purpose.

E. Conductors crossing hinges shall be made up into groups not exceeding twelve and shall be so arranged that they will be protected from chafing when the hinged member is moved.

3.2 WIRE AND CABLE TERMINATION

A. Power conductors, AWG No. 8 and larger may be terminated directly in box-type lugs.

B. Solid conductors (when allowed for lighting and receptacle circuits) of AWG No. 10 and AWG No. 12 may be directly terminated to screw terminals.

C. For any power, control, or signal wire terminating on screw type terminals; provide spade or ring tongue type terminations.

D. Stranded control conductors may be directly terminated in box type terminals at control panels. Insulated terminals shall be used also on all stranded instrumentation wiring.

E. Special instrumentation cables shall be terminated in accordance with the recommendations of the manufacturer of the equipment and subject to review by the Engineer.

F. No splices shall be used in power, control and/or signal wiring. The wiring shall be continuous from point-to-point.

G. Terminals and connectors shall be installed with the compression tool recommended by the terminal manufacturer. Solid wire shall not be lugged, but shall be terminated with a full ring eye of the wire under the binding-head screw or saddle of the terminal block. Electrical spring connectors may be used only on lighting circuits.

3.3 COLOR CODING

A. Wiring shall conform to the following color code.

B. Insulation on phase conductor sizes AWG No. 10 and smaller shall be colored, No.8 AWG and larger may have black insulation with plastic tape of the appropriate color from the table below.

C. Insulation on the grounded conductor (neutral) sizes AWG No. 8 and smaller shall be colored, AWG No. 6 and larger may have black insulation with plastic tape of white or gray in accordance with the table below.

Description	120/208V	Control
Phase A (Left)	Black	--
Phase B (Center)	Red	--
Phase C (Right)	Blue	--
Neutral	White	White
Ground	Green	Green
120 VAC Control	--	Red
120 VAC Control	Neutral	White
DC Control (+)	--	Blue
DC Control (-)	--	Gray
External Source	--	Yellow

D. All control wiring in control panels or other enclosures that is powered from an external source and is not disconnected by the control panel disconnect shall be terminated at a disconnecting terminal block upon entering the enclosure. The color of the wire shall then be changed to yellow to identify it as being powered from an external source. Provide identification nameplate on exterior of enclosure to indicate sources of external power.

3.4 TERMINAL MARKING

A. All terminals in instrument and relay enclosures, instrument panels, field panels and control stations, as well as connections to mechanical equipment, shall have reference number and letter in accordance to the following:

1. h = Control power hot (usually 120V or 24V)

2. n = neutral
3. g = ground
4. c = control (use if none of the above letters apply)
5. p = power (usually 480V)
6. s = signal (usually 4-20ma or 1-5V) (use if none of the above letters apply)
7. B = DC + and -

3.5 CONDUCTOR SPACING

A. Unless specifically shown otherwise on the Drawings, in all areas maintain a minimum 2-inch separation between all conductors of different voltages. For parallel runs over 6 feet maintain the following minimum separation between conductors:

1. 120 VAC control wire and 480 VAC 2 inches

3.6 WIRE BENDING RADIUS

A. The radius of bends in all wire (conductors and cables) shall not be less than five (5) times the outside diameter of the wire. Any wire installed with bends less than five times the diameter which the Engineer deems has caused that insulation to be damaged shall be removed and new wire shall be installed.

3.7 VISUAL AND MECHANICAL INSPECTIONS

A. Inspect exposed section for physical damage.

B. Verify that cable is supplied and connected in accordance with Drawings and Specifications, and that phases are labeled correctly.

3.8 TESTING

A. See Section 26 01 26 – Electrical Testing.

END OF SECTION

SECTION 26 05 26
GROUNDING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Material and installation requirements for:
   1. Grounding

1.2 DESCRIPTION OF WORK

A. This section covers furnishing and installing all grounding and/or bonding conductors, connectors, ground rods and terminations as required to meet these specifications and to comply with Article 250 of the National Electric Code.

1.3 RELATED SECTIONS

A. Related Sections include but are not necessarily limited to:
   1. Section 26 00 00 – Electrical General Provisions
   2. Section 26 00 01 – Electrical Scope of Work
   3. Section 26 00 02 – Basic Materials and Methods
   4. Section 26 01 26 – Electrical Testing
   5. Section 26 05 19 – Wire and Cable
   6. Section 26 05 33 – Raceways
   7. Section 26 24 16 – Panelboards
   8. Section 26 27 13 – Service and Metering
   9. Section 26 28 00 – Overcurrent Protective Devices
   10. Section 26 32 13 – Power Generation

1.4 STANDARDS AND REFERENCES

A. All materials and equipment specified herein shall, within the scope of UL Examination Services, be approved by the Underwriter's Laboratories for the purpose for which they are used and shall bear the UL label.

B. Products shall be designed, manufactured, tested, and installed in compliance with the following standards:
   1. American National Standards Institute:
      a) ANSI/IEEE Standard 142 Recommended Practice for Grounding of Industrial and Commercial Power Systems.
   2. American Society for Testing and Materials (ASTM):
      a) B8, Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft.
   3. National Fire Protection Association (NFPA):
      a) 70, National Electrical Code (NEC).
   4. Underwriters Laboratories, Inc. (UL):
      a) 467, Electrical Grounding and Bonding Equipment.

C. All materials and equipment specified herein and their installation methods shall conform to the latest published version of the National Electrical Code, NEC, Oregon Electrical Specialty Code (OESC) and meet the City of Heppner, OR building code as currently adopted.

1.5 SUBMITTALS

A. Shop Drawings
   1. See Section 26 00 00.
   2. See Section 26 01 26.
      a) After installation is complete:
         - Ground rod and system test results

1.6 DELIVERY, STORAGE, AND HANDLING

A. See Section 26 00 00.

PART 2 PRODUCTS

2.1 GENERAL

A. For each electrical grounding connection, provide a complete assembly of materials to construct a completely grounded electrical system.

B. Raceways for grounding conductors shall be as specified in Section 26 05 19.

C. Grounding cable, wire and connectors shall be as specified in Section 26 05 33.

D. Grounding conductors and jumpers shall be connected to each other and to items to be grounded by means of approved type pressure connectors, clamps, and other suitable methods approved by the Engineer. No solder connections shall be made.

2.2 GROUNDING ELECTRODE CONDUCTORS

A. All concrete encased or direct buried underground grounding electrode conductors shall be soft drawn stranded bare copper cable, conforming to ASTM B8.
   1. Sized as required by Table 250-66 of the NEC, except where a larger size conductor is shown on the Contract Drawings.

B. Equipment grounding conductor:
   1. Green copper conductor: Identical insulation to phase conductors.
   2. Sized as required by Table 250-122 of the NEC, except where a larger size conductor is shown on the Contract Drawings.

2.3 GROUND ROD BOXES

A. Provide ground rod boxes for each ground rod. Ground rod boxes shall be concrete with traffic rate covers, Fogtite SP-1, or approved equal.

2.4 GROUNDING ELECTRODE RODS

A. Grounding electrode rods used shall be a minimum of ¾” diameter by 10’ long, steel core and 10 mil thick copper jacket (copperclad). UL listed.

B. Heavy uniform coating of electrolytic copper molecularly bonded to a rigid steel core. Corrosion resistant bond between the copper and steel. Hard drawn for a scar-resistant surface. UL listed.
   1. Blackburn
   2. Thomas & Betts

2.5 GROUND CLAMPS

A. Ground clamps for connecting grounding conductors to copper, brass, or lead pipes shall be made of copper alloy. If pipes are steel or iron, the ground clamps should be made of galvanized iron. These clamps shall be designed to provide permanent and positive pressure and to avoid mechanical injury to the pipe. Use exothermic welds for connecting ground wires to ground rods for all below grade counterpoise grounds, grids, and elsewhere where noted on the Drawings.

B. High copper alloy content, compression type, noncorrosive.

C. UL 467 listed.
   1. Burndy
   2. ILSCO
   3. Thomas & Betts

2.6 EXOTHERMIC WELD CONNECTIONS

A. Use Cadweld or approved equal system of exothermic welding for welded grounding connections where shown on the Drawings or specified.
   1. Copper oxide reduction by aluminum process.
   2. Molds properly sized for each application.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Remove paint, rust, or other nonconducting material from contact surfaces before making ground connections.

C. Where ground conductors pass through floor slabs, sleeves of intermediate metal conduit of the required size, shape, and length shall be provided, unless otherwise specified or shown on Drawings.

D. Grounding System
   1. Locate ground rods at approximate locations shown on Drawings.
   2. System shall include a minimum of two (2) ground rods separated by not less than six (6) feet.
   3. All equipment racks, vaults, concrete pads, antenna masts and metal fences shall be bonded to the grounding electrode system.
   4. All bonds buried below grade or embedded in concrete shall be exothermically welded.
   5. Install rods in firm soil outside of excavated areas.
   7. Drive top of rod to minimum depth of 6 IN below finished grade unless otherwise noted on Contract Drawings.
   8. Use driving studs or other suitable means to prevent damage to threaded ends of sectional rods.
   9. Interconnect all ground rods with grounding electrode conductor:
   10. Size per the NEC unless a larger size is shown on the Drawings.
   11. Do not splice grounding electrode conductor.
   12. Provide excavation required for installation of ground conductors buried in earth.
   13. Allow sufficient slack to prevent conductor breakage during backfill or due to ground movement.

14. Leave taps, junctions, and splices uncovered until inspected by Engineer.
15. Backfill around grounding system completely, thoroughly tamping to provide good contact between backfill materials and ground rods and conductors.
16. Bond underground metal piping to the grounding system in accordance with NEC 250. Grounding clamps may be utilized on piping if exothermic welds may damage structural integrity.
17. All underground connections shall be exothermically welded.

E. Complete system resistance:
   1. 15 Ohms or less.

3.2 RACEWAY GROUNDING - CONDUIT

A. All metallic conduit shall be electrically continuous.

B. Provide grounding-type insulating bushings:
   1. For all equipment not supplied with a conduit hub.

C. Bond all conduit, at entrance and exit of equipment, to equipment ground bus or ground lug.

D. Use manufactured conduit hubs at all panels.

E. Provide bonding jumpers if conduit are installed in concentric knockouts.

F. Make all metallic raceway fittings and grounding clamps tight to ensure equipment grounding system will operate continuously at ground potential to provide low impedance current path for proper operation of overcurrent devices during possible ground fault conditions.

G. Provide bonding jumper from equipment ground lug to RGS conduit if flexible conduit is utilized for equipment connections.

H. Provide bonding jumpers identical in conductor size to the largest ground conductor run within the conduit.

3.3 EQUIPMENT GROUNDING

A. Ground all voltage levels at the supply transformer from the secondary neutral to the grounding system.

B. Provide a grounded conductor between the supply transformer and the grounding buses of all supplied equipment.

C. Ground all equipment supplied from distribution equipment through the distribution equipment ground bus. Provide an equipment grounding conductor connected to the ground bus and equipment ground lug.

D. Provide a minimum of two separate grounding electrode conductors for bonding all primary distribution equipment ground buses to the grounding system.

E. Bond equipment fed from other equipment to that equipment.

F. Consider control devices (switches, indicating lights, meters, starters, relays, etc.) mounted in MCC's, switchgear, control panels, or other metal enclosures to be adequately grounded, if the enclosure ground lug or ground bus is properly grounded.

G. Do not splice grounding conductors.

H. Run all equipment grounding conductors in conduit.

I. Provide separate grounding conductors bonded to the grounding system for all DC equipment.

J. Ground unused and spare power and control cable at both ends.

K. Size all grounding conductors in accordance with Article 250 of the NEC unless larger size is shown on the Drawings.

3.4 TESTING

A. Ground Resistance Test:
   1. See Section 26 01 26.

END OF SECTION

SECTION 26 05 33
RACEWAYS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Material and installation requirements for:
   1. Conduits
   2. Conduit fittings
   3. Conduit supports

1.2 DESCRIPTION OF WORK

A. Provide electrical raceway and fitting work as shown, scheduled, indicated, and specified.

B. All electrical conductors shall be installed in conduit or surface metallic raceways. Conduit shall be as specified herein.

C. The types of electrical raceways and fittings required for the project include, but are not limited to, the following.
   1. Rigid metallic conduit (RMC)
   2. Liquidtight flexible metal conduit
   3. Rigid nonmetallic conduit

1.3 RELATED SECTIONS

A. Related Sections include but are not necessarily limited to:
   1. Section 26 00 00 – Electrical General Provisions
   2. Section 26 00 01 – Electrical Scope of Work
   3. Section 26 00 02 – Basic Materials and Methods
   4. Section 26 05 19 – Wire and Cable
   5. Section 26 05 26 – Grounding
   6. Section 26 27 13 – Service and Metering
   7. Section 26 32 13 – Power Generation
   8. Section 26 90 25 – Control Components

1.4 STANDARDS AND REFERENCES

A. All materials and equipment specified herein shall, within the scope of UL Examination Services, be approved by the Underwriter's Laboratories for the purpose for which they are used and shall bear the UL label.

B. Products and installation shall comply with applicable sections of the following standards:
   1. American Iron and Steel Institute (AISI)
   2. American National Standards Institute (ANSI):
      a) C80.1, Rigid Steel Conduit - Zinc-Coated
   3. ASTM International (ASTM):
      a) A123, Standard Specification for. Zinc Coating (Hot-Dip Galvanized) Coatings on Iron and Steel Products
      b) A153, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

c) D1784, Standard Specification for Rigid Polyvinyl Chloride (PVC) Compounds and Chlorinated Polyvinyl Chloride (CPVC) Compounds
d) D2564, Solvent Cements for PVC Plastic Pipe, Tubing, and Fittings
e) E84, Standard Test Method for Surface Burning Characteristics of Building Materials
f) F512, Standard Specification for Smooth-Wall PVC Conduit and Fittings for Underground Installation

4. National Electrical Manufacturers Association (NEMA):
   a) FB 1, Fittings and Supports for Conduit and Cable Assemblies
   b) OS 1, Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports
   c) TC 3, PVC Fittings for Use with Rigid PVC Conduit and Tubing
   d) 250, Enclosures for Electrical Equipment (1000 Volts Maximum)
5. Underwriters Laboratories, Inc. (UL):
   a) 6, Rigid Metal Conduit
   b) 50, Standard for Safety Enclosures for Electrical Equipment
   c) 360, Liquid-Tight Flexible Steel Conduit
   d) 467, Grounding and Bonding Equipment
   e) 514A, Standard for Safety Metallic Outlet Boxes
   f) 514B, Fittings for Cable and Conduit
   g) 651, Schedule 40 and 80 Rigid PVC Conduit
   h) 870, Wireways, Auxiliary Gutters, and Associated Fittings
   i) 1660, Liquid-Tight Flexible Nonmetallic Conduit

C. All materials and equipment specified herein and their installation methods shall conform to the latest published version of the National Electrical Code, NEC, Oregon Electrical Specialty Code (OESC) and meet the City of Heppner, OR building code as currently adopted.

1.5 SUBMITTALS

A. Shop Drawings
   1. See Section 26 00 00.

1.6 DELIVERY, STORAGE, AND HANDLING

A. See Section 26 00 00.

PART 2 PRODUCTS

2.1 GENERAL

A. Provide metal conduit, tubing, and fittings of the type, grade, size, and weight (wall thickness) as shown and required for each service. Where type and grade are not indicated, provide proper selection determined by this Section to fulfill the wiring requirements and complying with the NEC for electrical raceways.

B. For each electrical raceway system indicated, provide a complete assembly of conduit, tubing, or duct with fittings, including, but not necessarily limited to, connectors, nipples, couplings, expansion fittings, bushings, locknuts, other components and accessories as needed to form a complete system of the type indicated.

C. Conduit fittings shall be designed and approved for the specific use intended. Conduit fittings, including flexible, shall have insulated throats or bushings. Rigid conduits shall have insulated bushings, except insulated throat grounding bushings shall be used on all conduits without ground conductors and where required by N.E.C. Article 250.

2.2 ACCEPTABLE MANUFACTURERS

A. Provide products complying with these specifications and produced by one of the following:
   1. Rigid metallic conduits:
      a) Allied Tube and Conduit Corporation
      b) Triangle PWC Inc.
      c) Western Tube and Conduit Corporation
      d) Wheatland Tube Company
      e) LTV Steel Company
   2. Liquidtight Flexible Metal:
      a) AFC
      b) Anaconda Metal Hose
      c) Electri-Flex Company
      d) Flexi-Guard, Inc.
      e) Triangle PWC, Inc.
      f) Wheatland
   3. Rigid Nonmetallic Conduit:
      a) Carlon
      b) Cantex
      c) Triangle PWC, Inc.
   4. Raceway Fittings:
      a) Appleton Electric Company
      b) Cantex (PVC)
      c) Carlon (PVC)
      d) Crouse Hinds
      e) Efcor Division
      f) ETP-Uni-Couple
      g) O.Z. Gedney Company
      h) Raco, Inc.
      i) Republic Steel Corporation
      j) Steel City
      k) Thomas and Betts
   5. Support systems:
      a) Unistrut Building Systems
      b) B-Line Systems Inc.
      c) Kindorf
      d) Minerallac Fastening Systems
      e) Caddy

2.3 RIGID METALLIC CONDUITS

A. Rigid Galvanized Steel Conduit (RGS):
   1. Mild steel with continuous welded seam,
   2. Metallic zinc applied by hot-dip galvanizing or electro-galvanizing; threads galvanized after cutting,
   3. Internal Coating: Baked lacquer, varnish or enamel for a smooth surface.
   4. Standards: ANSI C80.1, UL 6.

2.4 RIGID NON-METALLIC CONDUIT

A. Schedules 40 (PVC-40) and 80 (PVC-80):
   1. Polyvinyl-chloride (PVC) plastic compound which meets, as a minimum, ASTM D1784 cell classification PVC 12233-A, B, or C,
   2. Rated for direct sunlight exposure,
   3. Fire retardant and low smoke emission,
   4. Shall be suitable for use with 90 Deg C wire and shall be marked "maximum 90 Deg C".
   5. Standards: ASTM D1784, NEMA TC 2, UL 651.

2.5 FLEXIBLE CONDUIT

A. PVC-Coated Flexible Galvanized Steel (liquid-tight) Conduit (FLEX-LT):
   1. Core formed of continuous, spiral wound, hot-dip galvanized steel strip with successive convolutions securely interlocked,
   2. Extruded PVC outer jacket positively locked to the steel core,
   3. Liquid- and vapor-tight.
   4. Standard: UL 360.

2.6 CONDUIT FITTINGS AND ACCESSORIES

A. Fittings for Use with RGS:
   1. Locknuts:
      a) Threaded steel or malleable iron,
      b) Gasketed or non-gasketed,
      c) Grounding or non-grounding type.
   2. Bushings:
      a) Threaded, insulated metallic,
      b) Grounding or non-grounding type.
   3. Hubs: Threaded, insulated and gasketed, metallic, for rain-tight connection.
   4. Couplings:
      a) Threaded, straight-type: Same material and finish as the conduit with which they are used on.
      b) Threadless type: Gland compression or self-threading type, concrete tight.
   5. Unions:
      a) Threaded galvanized steel or zinc plated malleable iron.
   6. Conduit bodies:
      a) Body: Zinc plated cast iron or cast copper free aluminum with threaded hubs,
      b) Standard and mogul size.
      c) Cover: Clip-on type with stainless steel screws. Gasketed or non-gasketed galvanized steel, zinc plated cast iron or cast copper free aluminum.
   7. Expansion couplings:
      a) 2 IN nominal straight-line conduit movement in either direction,
      b) Galvanized steel with insulated bushing,
      c) Gasketed for wet locations,
      d) Internally or externally grounded.

B. Fittings for Use with FLEX-LT:
   1. Connector:
      a) Straight or angle type,

b) Metal construction, insulated and gasketed,
c) Composed of locknut, grounding ferrule and gland compression nut,
d) Liquid-tight.

2. Standards: UL 467, 514B.

C. Fittings for Use with Rigid Non-Metallic Conduit:
1. Coupling and adapters shall be of the same material, thickness, and construction as the conduits with which they are used.
a) Standards: UL 651, NEMA TC 3.
2. Solvent cement for welding fittings shall be supplied by the same manufacturer as the conduit and fittings.
a) Standards: ASTM D2564.

D. Weather and Corrosion Protection Tape:
1. PVC based tape, 10 mils thick,
2. Protection against moisture, acids, alkalis, salts and sewage and suitable for direct burial,
3. Used with appropriate pipe primer.

2.7 SUPPORT SYSTEMS

A. Multi-conduit surface type supports:
1. Material requirements.
a) Stainless steel: AISI Type 316.

B. Single conduit support fasteners:
1. Material requirements:
a) Stainless steel: AISI Type 316

PART 3 EXECUTION

3.1 INSTALLATION

A. General:
1. Install electrical raceways and fittings as shown in accordance with the manufacturer's written instructions, the applicable requirements of the NEC, and in accordance with recognized industry practices to ensure that products serve the intended function. Complete electrical raceway installation before starting the installation of wire and cable.

B. Conduit Size:
1. Minimum conduit size for power wiring shall be ¾". Minimum conduit size for control wiring shall be ¾". Minimum conduit size for voice/data wiring shall be 1".

C. Rigid Steel:
1. Use rigid steel metal conduit to run all electrical raceway systems where exposed to weather; in damp or wet locations; where subject to physical damage; and where cast in concrete floors slabs which have waterproof membranes. Use rigid steel or IMC conduit for all exposed feeders. IMC conduit shall not be used in sizes larger than 4". Use threaded type couplings and fittings. Split type couplings and fittings are not acceptable.

D. Liquidtight Flexible Metal:
1. Use liquidtight flexible metal conduit and fittings for all motor connections, and for other electrical equipment connections where subject to movement and vibration and when subject to one or more of the following conditions: (1) exterior locations, moist or humid atmosphere where condensation can be expected to accumulate; (2) corrosive

atmosphere, subject to water spray; subject to dripping oil, grease or water. Install internal ground wire in flexible conduit with grounding bushings. Maximum length shall be 6'0" and minimum length shall be 3'0".

E. Rigid Nonmetallic:
   1. Use PVC conduit directly buried in earth, cast in concrete slabs, and where subject to corrosive environment. Use Schedule 40 where direct buried. Use Schedule 80 above grade for ground wires only and size adjusted to have same fill area as if Schedule 40 were used.
   2. PVC shall not be installed on the electrical equipment rack.

3.2 EXTERIOR CONDUIT SYSTEMS

A. Exterior conduit systems shall meet all of the general installation requirements for interior conduit systems.

B. All exterior conduit systems shall be completely watertight. All fasteners and supports used with exterior conduit systems shall be stainless steel.

C. Install underground conduits with sealing glands equal to OZ Type "FSK" or approved equal exterior to entrance and OZ Type "CSB" or approved equal to prevent water seepage.

D. Maintain 12" of earth or 2" of concrete separation between electrical conduits and other services or utilities below grade. Maintain 10'0" separation between parallel underground power and voice/data conduits. Where power and voice/data conduits cross below grade, crossing shall be at right angles (90 degrees) with a minimum 2'0" vertical separation.

E. For all metallic conduit threads, paint with Thomas & Betts Kopr-Shield anti oxidation compound.

3.3 EMPTY CONDUIT RACEWAY SYSTEMS

A. General: Empty conduit in which wire is to be installed by others shall have pull wires installed. The pull wire shall be No. 14 AWG zinc-coated steel, or plastic having not less than 200 pounds tensile strength. Not less than 12" of slack shall be left at each end of the pull wire.

3.4 IDENTIFICATION

A. See Section 26 00 02 for applicable labeling requirements.

B. Conduit Markers
   1. All conduits scheduled shall be identified at each end with a permanent tag. Conduits shall be labeled as identified on the Conduit and Wire Schedule. Attach tags to cables or conduit by using a stainless steel cable tie. Identify concealed conduits entering equipment, panelboards, or enclosures by attaching marker tag to cables as they exit the conduit. Embedded conduits and conduits routed underground shall be labeled also at all points of entry and exit by attaching a phenolic marker tag with stainless steel cable tie to the exterior of the conduit.

3.5 FIELD INSPECTION

A. Prior to backfilling and encasing conduits installed underground, all raceways shall be inspected by the Engineer. The Engineer shall be contacted a minimum of one week in advance for field inspection of concealed raceway. No raceway shall be concealed or backfilled until inspected by the Engineer.

END OF SECTION

SECTION 26 24 16
PANELBOARDS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Material and installation requirements for:
   1. Panelboards.
   2. Surge protection components.

1.2 DESCRIPTION OF WORK

A. This section covers furnishing and installing a panelboard including cabinets, as shown, scheduled, indicated, and specified.

1.3 RELATED SECTIONS

A. Related Sections include but are not necessarily limited to:
   1. Section 26 00 00 – Electrical General Provisions
   2. Section 26 00 01 – Electrical Scope of Work
   3. Section 26 00 02 – Basic Materials and Methods
   4. Section 26 01 26 – Electrical Testing
   5. Section 26 05 19 – Wire and Cable
   6. Section 26 05 26 – Grounding
   7. Section 26 28 00 – Overcurrent Protective Devices

1.4 STANDARDS AND REFERENCES

A. All materials and equipment specified herein shall, within the scope of UL Examination Services, be approved by the Underwriter's Laboratories for the purpose for which they are used and shall bear the UL label.

B. Products shall be designed, manufactured, tested, and installed in compliance with the following standards:
   1. National Electrical Manufacturers Association (NEMA):
      a) AB 1, Molded Case Circuit Breakers.
      b) PB 1, Panelboards.
      c) PB 1.1, Instruction for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.
   2. Underwriters Laboratories, Inc. (UL):
      a) UL 1449, Standard for Surge Protective Devices.
      b) UL 67, Panelboards.

C. All materials and equipment specified herein and their installation methods shall conform to the latest published version of the National Electrical Code, NEC, Oregon Electrical Specialty Code (OESC) and meet the City of Heppner, OR building code as currently adopted.

1.5 SUBMITTALS

A. Shop Drawings
   1. See Section 26 00 00.

1.6 DELIVERY, STORAGE, AND HANDLING

A. See Section 26 00 00.

B. Deliver in factory-fabricated, water-resistant wrapping.

C. Handle carefully to avoid damage to material component enclosure, and finish.

D. Store in a clean, dry space and protect from the weather.

PART 2 PRODUCTS

2.1 GENERAL

A. Panelboards shall be dead front safety type equipped with molded case circuit breakers as shown and scheduled.

2.2 ACCEPTABLE MANUFACTURERS

A. Provide products complying with these specifications and produced by one of the following:
   1. Schneider Electric (Square-D)
   2. Eaton
   3. Siemens

2.3 MATERIALS AND COMPONENTS

A. Busing Assembly
   1. Bussing shall be tin-plated 55% conductivity aluminum, plated by the latest Alstan process. Bus structure and mains shall have ratings as shown and scheduled and shall be phase sequence construction per NEC 408. Such ratings shall be established by heat rise tests with maximum hot spot temperature on any connector or busbar not to exceed 65 degree Celsius rise above 40 degrees Celsius ambient. Heat rise test shall be conducted in accordance with UL 67. The use of conductor dimensions will not be accepted instead of actual heat tests. All bus joints shall be bolted with medium carbon steel, zinc, or cadmium plated hardware equipped with lock washers and torqued to the manufacturer's recommended settings (usually ASTM standards). All bolted connections shall have Belleville washers. Furnish a bare un-insulated, or an isolated, where noted, ground bus inside each panelboard enclosure and elsewhere where noted on the Drawings. Furnish an isolated full size neutral bus, insulated where noted, in all panels where the neutral is present.
   2. Bus structure and mains shall have ampacity ratings to serve the load with 25% spare capacity.

B. Molded Case Circuit Breakers
   1. Circuit breakers shall be of the molded case; thermal magnetic type equipped with individually insulated, braced and protected connectors. The front faces of all circuit breakers shall be flush with each other. Tripped indication shall be clearly shown by the breaker handle taking a position between "ON" and "OFF". Provisions for additional breakers shall be such that no additional connectors will be required to add breakers. Circuit breakers shall bolt on the main bus. All 2 and 3-pole breakers shall have common trips.
      a) All single-pole circuit breakers shall be either ambient or case-compensated (calibrated 40 degrees Celsius) thermal-magnetic type breakers, with inverse time delay on overloads and instantaneous magnetic trip on short circuits.

b) All multiple-pole breakers shall be common trip, thermal-magnetic type (calibrated 40 degrees Celsius). Twin, tandem, and half-size single-pole breakers, and breaker tie handles are not acceptable.

c) The breakers shall employ quick-make, toggle mechanism for manual operation, as well as automatic operation. The breakers shall have provisions for manually testing the tripping mechanism with the breaker removed from the panel.

2. Provide panelboard circuit breakers with interrupting capacity as shown, but in no case less than the following symmetrical amperes RMS:

Voltage (volts)	Interrupting Capacity
120/208	18,000 AIC

3. Ground fault circuit interrupter (GFCI) circuit breakers, where shown, shall be 6 ma ground fault trip and shall include a TEST button.

C. Lugs

1. Panelboards and distribution panels shall be provided with main lugs, main over-current devices, and feed-thru lugs as noted on the Drawings. Lugs shall be suitable for use with the cable size and material installed. Panel wire-ways shall provide adequate space for wiring to all lugs.

D. Spaces

1. Where space for future breakers is shown, panelboards enclosure shall include removable blank panels or knockouts to allow installation of future breakers and panelboard busing shall be complete, including all required connectors.

E. Integrated Equipment Rating

1. Each panelboard, as a complete unit, shall have a short-circuit rating not less than the available fault current or as indicated below. Such ratings shall have been established by tests on similar panelboards with the circuit breakers installed.
   a) Rated 240V or less: Short-circuit ratings not less than 10,000 A rms symmetrical.
   b) Rated 240V or more: Short circuit-ratings not less than 14,000 A rms symmetrical.
2. Full Rated: All devices shall be fully rated; series rating is not permissible.

F. Enclosures

1. Provide galvanized steel enclosures, NEMA Type 3R, minimum 16 gauge thickness, minimum 20” width, with no knockouts, unless shown otherwise. Provide doors with concealed hinges, spring-loaded doors pulls, flush lock and key, all panelboard enclosures keyed alike, equipped with interior circuit directory frame, card, and clear plastic covering. Door and trim shall be painted with manufacturers standard gray enamel finish over a rust inhibitor. Trim on flush mounted panels shall have concealed fasteners. Enclosure shall be for surface mounted as shown. Enclosures shall be fabricated by the same manufacturer as the panel distribution.

2.4 SURGE PROTECTIVE DEVICES

A. Provide with a surge protection system for the protection of all AC electrical circuits from the effects of lightning-induced currents, substation switching transients, and internally generated transients resulting from inductive and/or capacitive load switching.

B. Surge protective devices shall be listed in accordance with UL 1449, Standard for Surge Protective Devices.

C. Surge protection shall be Type 1 fed from a branch circuit overcurrent protective device or provided with other disconnecting means.

D. Surge protective devices shall be installed at each voltage level, providing a cascading level of surge protection. At a minimum, SPSs shall be provided at the panelboard, pump control panel and at each control panel. A pump control panel fed downstream of a panelboard shall be considered protected by an SPD installed at the upstream panelboard.

E. Surge protective devices shall be mounted internal and integral to the Pump Control Panel and external with the panelboard.

F. Surge protective devices shall be provided with dry contacts output to monitor alarm status.

G. Surge protective devices shall be provided with surge counter which displays the combined total number of surges detected.

H. Visible indication of proper device connection and operation shall be provided and shall be visible without removal of the panel interior cover.

I. The mounting position of the device shall permit a straight and short lead length connection between the device and the point of connection to the main bus.

J. Surge protective devices shall meet or exceed the following criteria:

1. Peak Surge Current Rating Per Phase shall not be less than (based on 8/20us Waveform):

Voltage (volts)	Peak Surge Current Rating
120/208	200,000 Amps

2. Protection modes for grounded wye circuits with 120/208V, 3-phase, 4-wire circuits shall not exceed the following:
   a) Line to Neutral: 1200V.
   b) Line to Ground: 1200V.
   c) Line to Line: 2000V.
3. Transient Joule Rating/Phase (Based on 10/1000 µs Waveforms): 920 Joules.
4. Short Circuit Current Rating (SCCR): Equal or exceed 100 kA.

K. Units may be manufactured using Metal Oxide Varistors (MOV's) as primary protection component, or as a "hybrid" system using MOVs, Gas Tubes, Inductors, capacitors, and/or diodes. However, units relying solely on gas tubes or diodes are not acceptable.

L. Surge protective devices shall be of solid-state componentry and shall operate bidirectionally.

M. Surge protective devices shall be of Schneider Electric EMA series, or approved equal.

PART 3 EXECUTION

3.1 INSTALLATION OF PANELBOARDS AND ENCLOSURES

A. Install panelboards and enclosures as shown; including electrical connections, in accordance with the manufacturer’s written instructions, the applicable requirements of NEC, the NECAs “Standard of Installation”, and recognized industry practices to ensure that products serve the intended function.

B. Coordinate installation of panelboards and enclosures with cable and raceways installation work. Verify that wall thickness is adequate where recessed panels are shown.

C. Anchor enclosures firmly to walls and structural surfaces ensuring that they are permanently and mechanically secured.

3.2 TESTING

A. Prior to energization, check for continuity of circuits and for short circuits.

3.3 IDENTIFICATION

A. Refer to Section 26 00 02 for applicable labeling requirements and nameplates.

B. Circuit Index Card
   1. Type the enclosure’s circuit directory card upon completion of work.
   2. Refer to Section 26 00 02 for additional requirements.

END OF SECTION

SECTION 26 27 13
SERVICE AND METERING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Service and Metering.

1.2 DESCRIPTION OF WORK

A. Work consists of revisions to the existing utility service secondary conduit/conductors, service entrance equipment and coordination with the serving utility to provide revisions to the power service listed below or indicated on the Drawings:

Ampacity	Voltage	Phase	Wire	Lateral	Transformer
800	120/208	3	4	Underground	Pad mount (#7330, 300kVA)

1.3 RELATED SECTIONS

A. Related Sections include but are not necessarily limited to:
   1. Section 26 00 00 – Electrical General Provisions
   2. Section 26 00 01 – Electrical Scope of Work
   3. Section 26 00 02 – Basic Materials and Methods
   4. Section 26 05 26 – Grounding
   5. Section 26 28 00 – Overcurrent Protective Devices

1.4 STANDARDS AND REFERENCES

A. All materials and equipment specified herein shall within the scope of UL Examination Services, be approved by the Underwriter's Laboratories for the purpose for which they are used and shall bear the UL label.

B. Service equipment shall be listed and labeled by UL as "suitable for use as service equipment".

C. All materials and equipment specified herein shall conform with all applicable NEMA, ANSI and IEEE Standards

D. All materials and equipment specified herein and their installation methods shall conform to the latest published version of the National Electrical Code, NEC and meet the City of Hayden, Idaho, Sewer and Pump Station Policies and Procedures as currently adopted.

1.5 QUALITY ASSURANCE

A. Comply with all serving utility company standards and requirements.

1.6 SUBMITTALS

A. Shop Drawings
   1. See Section 26 00 00.

1.7 SCHEDULING WORK WITH THE UTILITY COMPANY

A. The Contractor shall be fully and completely responsible for all scheduling and coordination with the utility company. The Contractor shall coordinate and schedule power outages, power service for operation and construction, and power service as may be required by the facility or site prior to final acceptance of the project.

B. The Contractor shall make all necessary applications for service with the Utility and shall notify the Owner in writing of any obligations that the Owner must fulfill for service to be started, installed, or modified.

1.8 CONTRACTOR/UTILITY INTERFACE RESPONSIBILITIES

A. The electrical utility providing service to this facility is:

Utility Name	Phone Number
Columbia Basin Electric Cooperative	541-676-9146

B. During design, contact was made with **Brian Kollman**, BrianK@colmbiabasin.cc of the serving utility. The division of responsibilities stated below has been determined by coordination with the utility. The Contractor shall comply with all utility company standards and requirements.

C. The Contractor shall notify the Owner (in writing) of any obligations or forms that the Owner is responsible to provide for service.

D. All utility company charges for and related to the final permanent service to the facility will be paid by the Owner, directly to the utility company and shall not be included in the Contractors bid price.

1.8.2 THE UTILITY COMPANY WILL

A. De-energize the transformer and remove existing secondary conductor terminations.

B. Terminate repurposed secondary conductors from the new service entrance rated main disconnect.

1.8.3 THE CONTRACTOR SHALL

A. Remove existing secondary conductors to the facility. Preserve and protect the existing conduit from the edge of pavement to the existing facility MDP.

B. Remove existing conduit from the transformer secondary compartment to a point for interception and extension to the new automatic transfer switch.

C. Provide secondary service, including new underground secondary conduit and **reuse of existing** secondary conductors, cut to length, from the new service entrance rated main disconnect to the existing transformer secondary compartment for termination.

1. Existing secondary conductors are two (2) sets of four (4) 600MCM Aluminum from the existing transformer secondary to the facility MDP located in room 119.
2. Reuse the existing 600MCM Aluminum conductors to the greatest extent feasible and dispose of the excess.
3. Maintain the same phase termination (rotation) setup as to not disrupt motors, elevators, and other facility equipment. Any damage to equipment due to improper phase rotation will be at the expense of the Contractor.

D. Coordinate with the serving utility to minimize all outages and downtime to the facility. Service cutovers will be limited to **weekends only** to limit interruptions to the building operations.

E. The existing meter will be reused with the existing CT metered secondary within the transformer.

PART 2 PRODUCTS

2.1 SERVICE ENTRANCE

A. Service entrance equipment shall be as indicated on the Drawings.

2.2 GROUND RODS AND GROUND ROD BOXES

A. See Section 26 05 26 – Grounding

PART 3 EXECUTION

3.1 GROUNDING ELECTRODE SYSTEM

A. The grounded conductor and ground bus shall be connected to the grounding electrode system, via the grounding electrode conductor as indicated on system one-line diagram.

B. The system shall be as indicated in Article 250 of the National Electrical Code.

3.2 UNDERGROUND SECONDARY SERVICE

A. Install in accordance with Section 26 05 33.

3.3 UTILITY REQUIREMENT VERIFICATION

A. The Contractor shall coordinate and submit all equipment, materials, etc. related to the utility work to the serving utility to verify conformance to the Utility's requirements for service. The Contractor shall also submit any plans for the installation of the primary and secondary service for approval by the Utility prior to excavation. Any discrepancy between the Utility requirements and the Contract documents shall be brought to the immediate attention of the Engineer.

END OF SECTION

SECTION 26 28 00
OVERCURRENT PROTECTIVE DEVICES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Material and installation requirements for:
   1. Fuses
   2. Circuit Breakers

1.2 DESCRIPTION OF WORK

A. This section covers the furnishing and installation of all fuses and circuit breakers used in this project.

1.3 RELATED SECTIONS

A. Related Sections include but are not necessarily limited to:
   1. Section 26 00 00 – Electrical General Provisions
   2. Section 26 00 01 – Electrical Scope of Work
   3. Section 26 00 02 – Basic Materials and Methods
   4. Section 26 01 26 – Electrical Testing
   5. Section 26 05 19 – Wire and Cable
   6. Section 26 05 26 – Grounding
   7. Section 26 24 16 – Panelboards
   8. Section 26 27 13 – Service and Metering
   9. Section 26 32 13 – Power Generation

1.4 STANDARDS AND REFERENCES

A. All materials and equipment specified herein shall, within the scope of UL Examination Services, be approved by the Underwriter's Laboratories for the purpose for which they are used and shall bear the UL label.

B. Products shall be designed, manufactured, tested, and installed in compliance with the following standards:
   1. American National Standards Institute:
      a) ANSI/UL 198E Class R Fuses.
      b) ANSI/UL 198C High-interrupting-Capacity Fuses, Current-Limiting types, Class L.

C. All materials and equipment specified herein and their installation methods shall conform to the latest published version of the National Electrical Code, NEC and meet the City of Hayden, Idaho, Sewer and Pump Station Policies and Procedures as currently adopted.

1.5 SUBMITTALS

A. Shop Drawings
   1. See Section 26 00 00.

1.6 DELIVERY, STORAGE, AND HANDLING

A. See Section 26 00 00.

PART 2 PRODUCTS

2.1 FUSES

A. Fuses shall be of the type and amperage indicated on the drawings. The voltage rating shall be appropriate for the application indicated. The fuse types indicated on the drawings imply a certain set of fuse characteristics. No substitutions of fuse types will be allowed without written approval from the Engineer.

B. All fuses used on the project shall be provided with “blown fuse” indicators.

C. Where fuses in motor circuits are indicated but not sized, provide Manufacturer's recommended fuse size based on actual motor installed.

D. Provide in-line or integrally-mounted fuse clips on control power or low-voltage transformer.

E. Provide fuse puller or pullers for fuse sizes used.

F. Provide a minimum of two (2) spare fuses for each fuse used.

G. Acceptable Manufacturers:
   1. BUSSMAN
   2. GOULD SHAWMUT
   3. LITTLEFUSE
   4. RELIANCE

2.2 MOLDED CASE CIRCUIT BREAKERS

A. Molded case circuit breakers shall be quick-make and quick-break type. They shall have wiping type contacts. Each shall be provided with arc chutes and individual trip mechanisms on each pole consisting of both thermal and magnetic trip elements. Two and three pole breakers shall be common trip. Circuit breakers utilizing handle ties shall not be allowed. All breakers shall be calibrated for operation in an ambient temperature of 40°C. Molded case circuit breakers shall be trip-free. Each breaker shall have trip indication independent of the ON or OFF positions.

B. Breakers shall have lugs UL listed for both copper and aluminum.

C. Circuit breakers shall be capable of accepting the cable shown on the drawings. Circuit breakers not capable of accepting the cable shown shall not be acceptable.

D. Breakers shall have the interrupting rating and trip rating indicated on the drawings.

E. Circuit breakers 250-ampere frame and below shall be Cutler-Hammer type Westinghouse Series C with thermal-magnetic trip units and inverse time-current characteristics. A push-to-trip button on the front of the circuit breaker shall provide a local manual means to exercise the trip mechanism.

F. Ground-Fault Circuit-Interrupter (GFCI) Circuit Breakers shall have Class A ground-fault protection (6-mA trip) with test button.

G. Circuit breakers 400-ampere through 1200-ampere frame shall be Cutler-Hammer type Westinghouse Series C with microprocessor based RMS sensing trip units. A push-to-trip button on the front of the circuit breaker shall provide a local manual means to exercise the trip mechanism.

2.3 USES

A. Breakers covered under this specification may be installed in switchboards, panelboards, motor control centers, combination motor starters, and individual enclosures.

2.4 ENCLOSURES

A. Unless otherwise shown on the drawings, enclosures for protective devices shall be NEMA rated for the environment in which they are installed. Circuit breaker enclosures shall be NEMA 3R rated.

PART 3 EXECUTION

3.1 INSTALLATION

A. Fuses and circuit breakers shall be installed in their respective enclosures and locations in such a manner as to ensure tight connections so as to preclude arcing and overheating.

B. Install fuses in fuse holders immediately prior to energization of the circuit in which the fuses are installed. Fuses shall not be installed and shipped with equipment.

C. Labels

1. Place fuse identification labels, showing fuse size and type installed, inside the cover of each switch or other location where fuses are installed.

END OF SECTION

SECTION 26 32 13
POWER GENERATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Material and installation requirements for:
   1. Standby power generator
   2. Automatic transfer switch

1.2 DESCRIPTION OF WORK

A. This section covers furnishing and installing a standby power generator set including propane gas engine-driven generator with controls, output circuit breaker, automatic transfer switch, and all required auxiliary systems.

1.3 RELATED SECTIONS

A. Related Sections include but are not necessarily limited to:
   1. Section 26 00 00 – Electrical General Provisions
   2. Section 26 00 01 – Electrical Scope of Work
   3. Section 26 01 26 – Electrical Testing
   4. Section 26 05 19 – Wire and Cable
   5. Section 26 05 26 – Grounding
   6. Section 26 05 33 – Raceways
   7. Section 26 28 00 – Overcurrent Protective Devices

1.4 STANDARDS AND REFERENCES

A. All materials and equipment specified herein shall, within the scope of UL Examination Services, be approved by the Underwriter's Laboratories for the purpose for which they are used and shall bear the UL label.

B. Products and installation shall comply with applicable sections of the following standards:
   1. American National Standards Institute (ANSI):
      a) C37.13, Low Voltage AC Power Circuit Breakers Used In Enclosures
      b) C37.50, Test Procedures For Low Voltage AC Power Circuit Breakers Used in Enclosures
      c) C37.90a, IEEE Guide for Surge Withstand Capability (SWC) Test
   2. National Electrical Manufacturers Association (NEMA):
      a) AB 1, Molded Case Circuit Breakers
      b) ICS 2, Standards for Industrial Control Devices, Controllers and Assemblies
      c) ICS 4, Terminal Blocks for Industrial Use
      d) ICS 6, Enclosures for Industrial Controls and Systems
      e) MG 1, Motor and Generators
      f) MG 2, Safety Standard for Construction and Guide for Selection, Installation and Use of Electric Motors and Generators
   3. National Fire Protection Association (NFPA):
      a) 70, National Electric Code (NEC)
      b) 37, Installation and Use of Stationary Combustion Engines and Gas Turbines

c) 110, Emergency and Standby Power Systems

4. Underwriters Laboratories, Inc. (UL):
   a) 489, Molded Case Circuit Breakers and Circuit Breakers Enclosures
   b) 1004B, Standard for Electric Motors (and Generators)
   c) 1008, Standard for Transfer Switch Equipment
   d) 2200, Standard for Stationary Engine Generator Assemblies

C. All materials and equipment specified herein and their installation methods shall conform to the latest published version of the National Electrical Code, NEC, Oregon Electrical Specialty Code (OESC) and meet the City of Heppner, OR building code as currently adopted.

D. All electrical equipment and materials, and the design, construction, installation, and application thereof, shall comply with all applicable provisions of the National Electrical Code (NEC), the Occupational Safety and Health Act (OSHA), International Building Code (IBC) and any applicable Federal, State, and local ordinances, rules, and regulations.

E. All materials and equipment specified herein shall, within the scope of UL Examination Services, be approved by the Underwriter's Laboratories for the purpose for which that are used and shall bear their label.

1.5 SUBMITTALS

A. Shop Drawings
   1. See Section 26 00 00.

B. In accordance with the “submittals” requirements in Section 26 00 00, the following project data shall be submitted by the Contractor prior to placement of a purchase order for the equipment:
   1. IBC certification that engine-generator set, batteries, battery racks, accessories, and components will withstand seismic forces at the installed location.
   2. Submitted materials shall be pdf with section bookmarks and an index.
   3. Wiring diagrams with details specific to this project showing all interface points and terminal numbers clearly identified.
   4. Specific information on the components provided for this project and all optional equipment provided.
   5. Provide specific and detailed wiring and connection diagram showing all details of field wiring connections and component connections for transfer switch, fuel monitor, louver controls, battery charger alarm contacts and customer contacts as specified in control panel, etc. Drawings shall show all terminal numbering and physical locations of terminals.
   6. Operations and programming/adjustments manual.
   7. Provide specific detailed information on the control features, their ranges, recommended set points etc.
   8. Detailed plan and elevation drawings of the generator set indicating overall dimensions and the specific location of all components, including the engine exhaust system, and enclosure.
   9. Detailed drawings indicating installation requirements and the specific location of vibration isolators and seismic snubbers.
   10. Detailed plan of the face of the control panel indicating overall dimensions and the specific location of all components.
   11. Detailed specifications and standard operating characteristics of the engine, the generator, and all components.

12. Certification by the manufacturer and documentation that appropriate linear and torsional vibration analyses have been performed and that engine and generator are compatible units.
13. Certification by the manufacturer and documentation that the generator set will meet or exceed the general requirements as specified in this section and the required performance as specified in Part 2 Section 2 of this specification.
14. Generator control schematic.
15. Engine control schematic.
16. Certification by the engine manufacturer of review and approval of the proposed engine application.
17. Certification by the generator manufacturer of review and approval of the proposed generator application.
19. Detailed specifications and drawings of the engine exhaust system.
20. Detailed specifications and drawings of the enclosure.
21. Detailed drawing showing generator plan and elevation views as proposed to be installed including all required electrical and mechanical code clearances.

C. After break-in and testing of the generator set, the following project data shall be submitted by the Contractor:
   1. Certified results of testing of the engine by the engine manufacturer.
   2. Certified results of testing of the generator by the generator manufacturer.
   3. Certified results of break-in and testing of the generator set by the manufacturer of the assembly.

1.6 DELIVERY, STORAGE, AND HANDLING

A. See Section 26 00 00.

B. The standby generator set(s) shall be stored at the factory until they must be shipped to the job site to prevent building construction delay.

C. The standby generator set(s) shall be crated and covered to protect it from damage during shipment and subsequent storage at the job site.

1.7 WARRANTY

A. The Contractor shall guarantee the generator set to be free of defects in design, materials, and workmanship for a period of two (2) years following the date of acceptance, by formal action of the Owner, of all work under the contract. The guarantee shall include all parts and labor and shall be secured by a written guarantee from the manufacturer to the Owner. The written guarantee shall be delivered to the Owner prior to date of acceptance of all work under the Contract.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. The generator set shall be manufactured by one of the following acceptable manufacturers**:**
   1. Caterpillar Tractor Company (CAT)
   2. Cummins Diesel Engine Company / ONAN Corporation
   3. Kohler Company

B. The dimensional data for the sizing of the generator is from **CAT**. The equipment of the manufacturer selected must fit within the space restrictions as shown on the plans.

C. Other alternate equipment manufacturers not listed shall be considered by the Contractor only when specifically identified by Addendum to the plans and specifications. Other manufacturers which desire to be designated as acceptable shall deliver a detailed statement of qualifications to the Engineer at least seven (7) calendar days prior to the scheduled bid opening. The statement of qualifications shall be in accordance with and shall also include pertinent items listed in the "Submittals" paragraph above and the following:
   1. Description of company,
   2. Resumes of principals and/or key employees,
   3. Description of expertise in design, assembly, and installation of natural gas engine-driven generator sets,
   4. Description of generator sets designed, assembled and installed in the last ten (10) years. Description shall include:
      a) Names of employees involved in each system,
      b) Detailed description and drawings of each system,
      c) Cost of each system,
      d) Names and telephone numbers of persons involved in operation and maintenance of each system.

D. Description of the service capabilities normally provided by the company, including resumes of employees assigned to field service and listing of service equipment.

E. Detailed plan and elevation drawings of the proposed generator set indicating overall dimensions and the specific location of all components, including the engine exhaust system.

F. Detailed specifications and standard operating characteristics of the engine, the generator and all components.

G. Additional information that may assist the Engineer in evaluation of the manufacturer and/or proposed generator set.

H. Acceptability of the manufacturers will be determined by the Owner and the acceptable manufacturers will be designated by Addendum mailed to holders of plans and specifications at least ten (10) working days prior to the date of opening of bids.

2.2 REQUIRED PERFORMANCE

A. Performance of the generator set shall be based on operation of the assembly with fan, battery charging alternator and all specified and required appurtenances.

B. The generator set shall be rated for continuous standby service, however the temperature rise of the generator shall not exceed 105 degrees C above a 40 degree C ambient, when producing full rated load for a continuous period of time.

C. Voltage Drop: The engine generator unit supplied must start the indicated load with a sustained RMS voltage drop no greater than 15% of rated phase to phase voltage during the starting period. The starting period shall be from 0 up to 3 seconds. The instantaneous voltage dip may be greater than 15% but shall not cause motor starter chatter or relay drop out or exceed a level which causes undesirable motor starting. If motor starting problems are encountered the size of the generator set shall be increased as required to reduce voltage dip until the motors can be started without problems. No additional cost shall be incurred by the Owner for the increased size of the generator set. The method of measurement shall be by light beam oscilloscope.

D. Frequency Regulation (Hz): Plus or minus 5% maximum, no load to rated load.

E. Voltage Regulation (V): Plus or minus 3% maximum, no load to rated load.

F. The generator set shall be capable of starting and operating the following load without exceeding the temperature ratings of the engine or the generator:

1. Total peak demand on the existing MDP DMS in Room 119: **38.9kVA on 8/27/25**. It is expected that the overall power factor will be .9 or greater.

G. The generator set shall be sized by the manufacturer to start and operate the load indicated herein while meeting the performance requirements set forth herein. The minimum acceptable engine generator set shall be capable of producing at minimum **117kW** at 0.9 power factor, continuously.

2.3 ENGINE

A. The engine shall be a water-cooled, in-line or V-type, four-stroke cycle, spark ignition, propane gas fueled unit. The engine shall be fully and completely capable of and equipped for driving electrical generators. The specific model of engine selected by the manufacturer of the generator set shall have an acceptable history of successful similar applications.

B. The engine shall be equipped with an electronic governor which shall control the speed of the engine and generator. The speed shall be controlled to maintain the generator output frequency within 0.25 percent of rated frequency from no load to full load.

C. The engine shall be equipped for operation with natural gas. The fuel system shall include a replaceable element fuel filter.

D. The engine shall be equipped with a pressurized oil lubricating system which shall include threaded, spin-on type, full flow lubricating oil filters which are located for easy removal. The lubricating system shall be equipped with spring-loaded bypass valves which will allow oil circulation if the filters are plugged.

E. The engine shall be equipped with an electric starting system which includes a lead acid battery set, an engine-driven battery charging alternator and appropriate electrical controls. The system shall be minimum 12 V. The batteries shall be mounted adjacent to the generator set on a fabricated steel housing. Batteries shall be rated minimum 225 ampere-hours.

F. The engine shall be equipped with a unit-mounted, radiator type cooling system which shall maintain the jacket water temperature at the level required for proper operation of the engine from no load to full load. The engine shall be equipped with one or two, as required, water jacket heater(s), which shall be thermostatically controlled to maintain the coolant temperature at 120 degrees F. Operation of the heater(s) shall be stopped while the engine is turning.

2.4 GENERATOR

A. The generator shall be brushless, revolving field-type, and shall be fully and completely capable of and equipped to be driven by a natural gas engine, and able to produce the starting and running kVA demanded by the connected load. The specific model of generator, selected by the manufacturer of the generator set, shall have an acceptable history of successful similar applications.

B. The generator shall comply with NEMA standard MG1. The generator shall be insulated to Class F requirements, however, the unit shall be sized and rated so that the temperature rise of the unit will not exceed 105 degrees C over ambient temperature of 40 degrees C under continuous, full load conditions in accordance with NEMA MG1-22.40. The generator shall be fully guarded in accordance with NEMA MC1-1.25.

C. The rotating brushless exciter shall incorporate a full wave, three phase rotating rectifier with hermetically sealed, metallic type, silicon diodes to supply main field excitation by means of a permanent magnet generator (PMG). A multiplate selenium surge protector shall be connected across the diode network to protect it against transient conditions.

D. The generator shall be coupled directly to the engine flywheel through a flexible driving disc for positive alignment. The generator housing shall bolt directly to the engine flywheel housing and shall have a single ball bearing support for the rotor. The rotor shall be

dynamically balanced up to 25 percent overspeed. The rotor shaft bearing shall be shielded type with provisions for easy servicing through grease pipes which extend to the exterior of the generator frame. The bearing shall be designed for a minimum B-10 bearing life of 40,000 hours.

E. The generator shall be designed and manufactured to be capable of sustaining at least 250 percent of rated current for at least 10 seconds under three-phase symmetrical short circuit conditions by inherent design of the unit or by a current boost system. The generator shall clear the fault automatically, without damage to the generator. The generator shall be designed and manufactured to be capable of sustaining at least 50 percent increase in rated speed for an unlimited time without mechanical damage.

F. The generator shall be equipped with a solid-state, volts-per-hertz type regulator which is compatible with both the engine and the generator. The regulator shall be capable of regulating the generator under sudden zero to full load changes.

G. The regulator shall be housed and mounted for protection of all components against moisture and vibration. The regulator assembly shall be mounted on the generator.

2.5 CONTROL PANEL

A. The generator shall be equipped with a control panel. The control panel shall be readily accessible, visible and shall be mounted such that the top of the control panel is no higher than 6'-0" above the finished floor when installed. Provide a fully solid-state, microprocessor based, auto start / stop generator set control module which is fully configurable via PC using USB and RS485 ModBus communication. The control shall provide all operating, monitoring, and control functions for the generator set. The control panel shall provide real time digital communications to engine ECU/ECM via CAN SAE J1939. The control panel shall be an EMCP 4, or approved equal.

B. Environmental requirements:
   1. –22°F to +158°F Operating Range
   2. 68°F to +131°F at 95% relative humidity for 48 hours (BS EN 60068-2-30, BS EN 60068-2-78)
   3. IP65 for front of module when installed in the control panel using sealing gasket
   4. Vibration at 2G, 8-500 Hz (BS EN 60068-2-6)
   5. Electromagnetic capability (BS EN 61000-6-2, BS EN 61000-6-4)
   6. Shock: withstand 15G (BS EN 60068-2-27)

C. Functional requirements:
   1. The control shall include 132 x 64-pixel, 2.9 inch x 1.8 inch, 4-line LCD display
   2. LCD alarm with text-based alarm/event descriptions and an alarm mute button in controller
   3. 3-phase generator sensing and protection
   4. Unbalanced load protection
   5. Breaker control via fascia buttons
   6. BMS (building management system) integration using MODBUS RTU
   7. Standard ISO labeling
   8. Multiple language capability
   9. Remote start/stop control
   10. Local run/off/auto control integral to system processor
   11. Cooldown timer
   12. Speed adjust
   13. Lamp test

14. Emergency stop push button
15. Front panel configuration with PIN protection

D. The generator control panel shall include the following digital monitoring readouts in English units:
   1. Engine:
      a) Status
      b) Oil pressure
      c) Oil temperature
      d) Coolant temperature
      e) Crankcase pressure
      f) Boost pressure
      g) Turbo inlet pressure
      h) Speed (RPM)
      i) Battery voltage
      j) Run time
      l) Crank attempt counter
      m) Successful start counter
      n) Service maintenance interval
      o) Real time clock
      p) Exhaust stack temperature
      q) Main bearing temperature
   2. Generator:
      a) AC volts (Line to Line, Line to Neutral)
      b) AC current (Average and Per Phase)
      c) AC frequency
      d) kW (Total and Per Phase)
      e) kVAR (Total and Per Phase)
      f) kVA (Total and Per Phase)
      g) Power Factor (Average and Per Phase)
      h) Total kW-hr
      i) Total kVAR-hr
      j) %kW
      k) %kVAR
      l) %kVA
      m) Bearing temperature protection
      n) Stator winding temperature protection

E. Test capabilities for control panel indication lights:
   1. A lamp mute & lamp test
   2. Selection mode
   3. Manual mode indicator
   4. Auto mode indicator
   5. Generator Breaker indicator
   6. Generator Available indicator

F. Inputs and Outputs:
   1. Programmable Digital & Analog Inputs: The Controller shall include the ability to accept total twelve (12) programmable digital and analog input signals. The signals may be

programmed for either high or low activation using programmable Normally Open or Normally Closed contacts. Additional I/O add-on capability is available through expansion modules.

2. Programmable Digital Outputs: The control shall include the ability to operate programmable digital DC output signals, integral to the controller. The DC outputs (2) for fuel and start shall be rated for 10 A resistive for 10 seconds, 5 A resistance continuous at module supply & other configurable DC outputs (6) are 2 A resistive at module supply. Additional I/O add-on capability available through expansion modules.

G. Three position (automatic/off/test) selector switch which shall:
   1. In the automatic position - allow the engine to automatically start when contacts in the transfer switch control circuit close and stop after the control circuit contacts open.
   2. In the off position - prohibit starting of the engine
   3. In the test position - cause the engine to start and remain in operation until the selector switch is moved to either of the other positions.
   4. Provide separate dry contact for each switch position.

H. An automatic starting system that shall cause and control operation of the engine starter motor until the engine has started. The starting system shall include manually adjustable timing circuits for control of the time of operation of the engine starter motor and the time from stopping of operation of the starter motor (after the engine has failed to start) to re-initiation of operation of the starter motor. The starting system shall enable the number of starting cycles to be manually selected and shall prohibit operation of the starter motor if the engine fails to start after three (3) starting cycles. The starting system circuitry shall include dry contacts for remote indication of generator set running and not running conditions.

I. Engine emergency shutdown controls that shall include sensors and control circuits which shall stop operation of the engine when the engine coolant temperature rises to a preselected value, when the engine coolant drops below a preselected level, the engine lubricating oil pressure drops to a preselected value, when the fuel level reaches the critical low pressure level, and the engine speed rises to a preselected value. The controls shall prohibit subsequent restarting of the engine until a reset switch is manually engaged.

J. Alarms and Shutdowns
   1. Engine emergency shutdown controls that shall include sensors and control circuits which shall stop operation of the engine when the engine coolant temperature rises to a preselected value, when the engine coolant drops below a preselected level, the engine lubricating oil pressure drops to a preselected value, when the fuel level reaches the critical low pressure level, and the engine speed rises to a preselected value. The controls shall prohibit subsequent restarting of the engine until a reset switch is manually engaged.
   2. The control panel shall monitor and provide alarm indication and subsequent shutdown for the following conditions. All alarms and shutdowns are accompanied by a time, date, and engine hour stamp that are stored by the control panel for multiple past and recent events.
      a. Engine Alarm/Shutdown:
         i. Low oil pressure alarm/shutdown
         ii. High engine temperature alarm/shutdown
         iii. Loss of coolant shutdown
         iv. Overspeed shutdown
         v. Over crank shutdown
         vi. Emergency stop shutdown
         vii. Low coolant temperature alarm
         viii. Low battery voltage alarm

ix. High battery voltage alarm
x. Control switch not in auto position alarm
xi. Battery charger failure alarm

b. Generator Alarm/Shutdown:
i. Generator phase sequence
ii. Generator over voltage
iii. Generator under voltage
iv. Generator over frequency
v. Generator under frequency
vi. Generator reverse power (real and reactive)
vii. Generator overcurrent

2.6 MAIN AND LOAD BANK CIRCUIT BREAKER

A. A main line, molded case, **208VAC, 400A, 3-pole** circuit breaker shall be installed as a load circuit interrupting and protection device. It shall operate both manually as an isolation switch and automatically during overload and short circuit conditions.

B. The trip unit for each pole shall have elements providing inverse time delay during overload and instantaneous magnetic tripping for short circuit protection. The circuit breaker shall meet standards established by Underwriters' Laboratories, National Electric Manufacturer's Association, and National Electric Code.

C. The circuit breaker shall be mounted adjacent to the generator control panel, isolated from vibration.

2.7 SUPPORT FRAME

A. The engine and generator shall be mounted on and supported by a welded support frame fabricated of structural steel members. The support frame shall specifically be designed by the manufacturer of the generator set to:
1. Resist bending forces and loads imposed by the engine and generator during transportation and during operation.
2. Limit torsional and bending movement caused by torque reactions
3. Prevent resonant vibration
4. Resist the bending and seismic loads per the UBC 2336 C.

B. The support frame shall be mounted on and supported by spring-type vibration isolators and shall be restrained by all-directional seismic snubbers as required by earthquake zone 3 conditions. The isolators and snubbers shall be selected by the manufacturer of the generator set. The manufacturer shall design the support frame for incorporation of and attachment to the isolators and snubbers and shall define all requirements for mounting of the isolators and snubbers on to the supporting surface.

2.8 AUTOMATIC TRANSFER SWITCH

A. One (1) automatic transfer switch shall be supplied as an integral component of the generator set. The transfer switch for this project was designed around the features and space requirements of **CAT**. The transfer switch shall be manufactured by one of the following acceptable manufacturers:
1. CAT
2. ONAN Corporation
3. CUTLER HAMMER
4. RUSSELL

B. An automatic transfer switch is to be supplied, installed, tested, and commissioned alongside the natural gas generator.

C. Transfer switch shall be well documented with clear wiring diagrams, and submittals shall include wiring diagram showing clearly all connections for field wiring with terminal numbering.

D. The transfer switch shall be equipped with three poles for normal and emergency service of **120/208V, 60 hertz, 3 phase**. The transfer switch shall be rated **800** amperes.

E. The transfer switch shall be mechanically and electrically held and rated to 600 volts for all classes of load and continuous inductive duty.

F. The transfer switch shall conform to UL 1008 Revision 4 provisions for Withstand Current Ratings and Closing Ratings.

G. The switch shall be capable of enduring 6000 cycles of complete opening and closing at rated current and voltage at a rate of 6 cycles per minute without failure.

H. The switch shall be double throw, inherently interlocked mechanically and electrically to prevent supplying the load from both sources simultaneously. The operating current shall be obtained from the source to which the load is to be transferred. The transfer mechanism shall be of the double break design with solid silver cadmium surface contacts and individual heat resistant arc chambers.

I. Single break contacts will also be acceptable if arc barriers and magnetic blow out coils are used. The contacts shall be capable of carrying 20 times the continuous rating for interrupting current.

J. All contacts, coils, etc. shall be readily accessible for replacement from front of panel without major disassembly of associated parts.

K. The transfer switch shall have UL 1008 label and listing.

L. The transfer switch shall have multi-lug terminals on the output for additional connections as shown on the drawings.

M. The transfer switch shall be mounted in the location as indicated on the drawings. The manufacturer of the transfer switch shall ship the automatic transfer switch to the system Integrator or Contractor, where it shall be installed. The manufacturer of the Automatic Transfer Switch shall coordinate with the Contractor to provide a final complete line up which will match in appearance and be so arranged as to facilitate simple cable interconnection in the field.

2.8.2 CONTROLS HARDWARE

A. All relays shall be provided with indicating LED lights for energized position indication.

B. Time delay relays shall be provided with timing and timed out LED indicators.

C. Panel front Indication lights shall be push-to-test or the switch shall have a push to test feature for indication lights, unless lights are LED.

D. All fuses shall be provided with “blown fuse” indicators.

E. All wiring shall be numbered at each end with basic wiring numbering scheme.

F. All terminals shall be clearly labeled.

G. All internal equipment shall be labeled.

H. All external devices shall be clearly labeled.

I. Provide nameplate on transfer switch as shown on the drawings.

J. If available as an option, provide a transfer switch with solid state logic ONAN POWER SENTRY CONTROL, or approved equal.

2.8.3 CONTROLS FEATURES

A. The transfer switch shall include the following accessories:

1. Undervoltage Sensor: Adjustable solid state low voltage sensing relays (pick up at 85 to 98 percent of normal voltage - set at 98%; drop out at 75 to 100 percent - set at 90% of pickup setting). Provide for each phase.
2. Time Delay Start and Stop on Drop Out: Solid state adjustable time delay on start (0 to 15 seconds). Set start delay for 15 seconds. Timer will send start signal to generator set CP (genset), where louver timer will allow 15 second delay for louvers to open prior to starting genset.
3. Time Delay Stop: Solid state adjustable time delay (0 to 10 minutes) to allow generator to cool down after normal power is restored and retransfer occurs. Set at 5 minutes.
4. Time Delay Transfer & Retransfer: Solid state, time delay, relay adjustable; 2 to 120 seconds for transfer to emergency and 0 to 30 minutes for retransfer to normal. Set at 5 minutes for retransfer to normal. Set at 3 seconds for transfer to emergency.
5. With or Without Load Selector Switch: Switch to select exercise with or without load.
6. Normal-Test Switch: Switch such that in the "Normal" mode the transfer switch will operate automatically and in the "Test" mode the generator will start for test purposes. This switch shall work in conjunction with the "With" or "Without" load switch. An extra contact block shall be provided on the normal-test switch for wiring to the Programmable Controller, if one is required.
7. Exercise Clock: An exerciser clock shall be provided which shall be programmable to exercise the generator set. The exerciser shall be adjustable from 15 to 60 minutes once each week. The exercise shall be either with or without load. If power fails during the exercise cycle, the load shall automatically pick up.
8. Programmed Transition: The load transfer control shall be capable of remaining in the neutral position for an adjustable time of .5 to 60 seconds, when transferring from one line power source to the other, to allow residual voltages to decay before application of the source. Set to 3 seconds for less than 50 hp loads.

B. Provide the following dry contacts each with terminals for field connection, 2Amp rated at 120VAC.

1. Two, separate, normally open dry auxiliary contacts; one indicating transfer switch is in NORMAL position and one indicating switch is in EMERGENCY position,
2. Four, separate, normally open, dry contacts; two indicating "commercial power / normal power" available, and two indicating generator / emergency power available.
3. Normally open, dry contact indicating generator called to run.

C. Position lights for normal and emergency position indication.

D. Two indication lights, one for emergency power available and one for normal power available.

E. Note: provide push to test type lights or push to test feature for all indication lights.

2.9 GENERATOR BATTERY CHARGER

A. Provide fully automatic constant voltage, current limiting battery charger sized for the generator starting batteries.

B. Charger shall have the following features: Protection fuses, DC ammeter, Temperature compensating voltage regulator, and LED alarm lamps indicating AC power fail, Low battery voltage, High battery voltage. Form C contacts for alarm indication, high and low battery alarm adjust pots, float voltage adjustment pot.

C. Charger shall monitor the battery voltage and control the SCR to deliver the optimum current level to the battery. The battery shall be permanently connected and when the battery approaches full charge preset voltage, the charging current shall automatically taper to zero amperes or to the state load on the battery. Use CAT, ONAN, OTIII and BT series or equal.

2.10 QUIET TYPE GENERATOR ENCLOSURE

A. Enclosure shall be provided for the standby generator.

B. Generator shall be enclosed in a sound attenuating housing which shall be totally weatherproof and dripproof. The unit shall be skid mounted and the walls and roof shall be adequately reinforced to carry all dead and live loads. The enclosure shall be sized to contain the generator set, control panel, main circuit breaker, battery charger, batteries, and to allow adequate room to service the entire unit.

C. The enclosure shall be a level 2 sound attenuating (25dBA @ 100% load) protective housing as manufactured by the generator manufacturer.

D. Doors shall be provided on each side of the enclosure and a control panel access door shall be provided on the end. All doors shall be equipped with handles and latches which are keyed alike.

E. The unit shall be primed and finished in accordance with manufacturer's standards. Color shall be approved by Owner.

F. The generator set shall be mounted in the enclosure using spring type vibration isolators between the generator set mounting skids and the enclosure.

PART 3 EXECUTION

3.1 INSTALLATION

A. The generator set shall be installed by the Contractor or, at the option of the Contractor, by the manufacturer of the generator set in accordance with the installation drawings and instructions prepared by the manufacturer. Installation shall be performed by workers who are skilled and experienced in the installation of generator sets and electrical systems.

B. Install fuel system in accordance to the requirements of the drawings, specifications, manufacturer, local codes, and the NEC. Any additional requirements or equipment necessary for a complete installation shall be provided by the Contractor at no additional expense to the Owner.

3.1.1 CONTROL PANEL & CIRCUIT BREAKER MOUNTING

A. The control panel shall be installed so that there is a minimum of 4 feet clear space in front of the panel, and the top of the panel is no more than 6 feet above the concrete pad.

B. Install the control panel for the generator on the generator at a height no more than 6 feet above the concrete pad to the top of the control panel. If the control panel mounted on the generator is higher than 6 feet, then the Contractor shall mount the control panel on a separate stand. The Contractor shall provide all necessary raceway, wiring, and mounting equipment at no additional cost to the Owner.

C. The main circuit breaker shall be installed so that there is a minimum of 4 feet clear space in front of the breaker. The Contractor shall coordinate the breaker installation with the generator manufacturer to meet this requirement.

D. The installation and space requirements stated above shall be verified prior to construction. Any discrepancies shall be stated in the submittals.

E. If the physical size of the structure in which the generator is being installed will not allow for these space requirements; The Contractor shall bring this to the immediate attention of the Engineer.

3.2 IDENTIFICATION

A. Refer to Section 26 00 02 for applicable painting, nameplates, and labeling requirements.

3.3 INSPECTION AND VERIFICATION OF INSTALLATION

A. After completion of the installation of the generator set, the manufacturer shall inspect the installation and verify that all components and wiring are correctly installed. The manufacturer shall determine the exact scope and nature of work required to correct any deficiencies and errors in the work and shall supervise the performance of such work.

1. All components of the generator set shall be calibrated by the manufacturer after completion of installation. Each component shall be adjusted to be within the manufacturer's required range and for the specific application. Components that cannot be properly calibrated or that are found to exceed the manufacturer's specified range or accuracy shall be removed and replaced.
2. After installation of the generator set is completed, the generator set shall be placed into operation by the manufacturer. The manufacturer shall revise, modify, adjust and reprogram the various components as required during and following start-up to provide proper operation.

3.4 ON-SITE OPERATION AND LOAD TEST

A. After the Manufacturer has inspected and verified the generator installation, the generator set shall be tested by the manufacturer. All components of the generator set shall be fully and completely operated and tested under simulated power failure conditions and under a full load for a period of at least two continuous hours. Load banks shall be provided by the manufacturer of the generator set as required to supplement the connected facility load and to provide full load conditions. Operating temperature, load amperes and voltage shall be recorded every 1/2 hour.

B. The on-site operation testing shall take place in the presence of the Engineer. The Contractor shall inform the Engineer a minimum of 3 days prior to the testing taking place. All controls and functions of the generator shall be operable and all auxiliary equipment shall be connected and all field wiring complete before the testing is to take place.

C. Test Load: Testing shall be performed at 0.8 PF with loads as specified below. Where the specific set has been tested at 0.8 PF as specified herein below, field-testing can be performed at 1.0 PF. The supplier of the engine-generator set shall provide a load bank of sufficient capacity to complement the available load for testing. The field test shall include running the emergency power system under loads as specified below:

1. 30 minutes at 25% of rated load (field load bank),
2. 15 minutes at 50% of rated load (field load bank),
3. 15 minutes at 75% of rated load (field load bank),
4. 30 minutes at 100% of rated load (field load bank).
5. Miscellaneous building loads may be used to supplement load bank.

D. Test Readings: The voltage current and frequency readings shall be recorded at 15-minute intervals throughout the test. Each automatic transfer switch shall automatically operate a minimum of four times during the test. There shall be a 15 minute unloaded run at the conclusion of the test to allow engine to cool before shutdown. The Contractor shall make all necessary hook-ups to facilitate field-testing and shall coordinate all fueling necessary from

the utility for field-testing. Refer to Section 26 01 26, “Electrical Testing”, for additional testing requirements.

3.5 OPERATION AND MAINTENANCE TRAINING

A. The manufacturer of the generator set shall conduct specifically organized training sessions covering operation and maintenance of the unit for personnel employed by the Owner. The training sessions shall be conducted to educate and train the personnel in maintenance and operation of all components of the unit. Training shall include, but not be limited to, the following:
   1. Preventative maintenance procedures,
   2. Trouble-shooting,
   3. Calibration,
   4. Testing,
   5. Replacement of components,
   6. Automatic mode operation,
   7. Manual mode operation,
   8. Fuel and monitoring system.

B. At least one (1) training session, at least two (2) hours in duration, shall be conducted at the site after start-up of the system. The manufacturer shall prepare and assemble specific instruction materials for each training session and shall supply such materials to the Owner at least two (2) weeks prior to the time of the training.

3.6 OPERATION AND MAINTENANCE DATA

A. See Section 26 00 00.

B. The supplier of the engine-generator set shall provide Operation and Maintenance Manuals which shall include, but not be limited to, the following:
   1. Preventive maintenance procedures,
   2. Trouble-shooting Calibration Testing,
   3. Replacement of components,
   4. Automatic mode operation,
   5. Programming,
   6. Manual mode operation,
   7. System schematics,
   8. As-built wiring diagrams of overall system,
   9. Catalog data and complete parts list for all equipment and control devices,
   10. Listing of recommended spare parts,
   11. Listing of recommended maintenance tools and equipment.

C. The supplier of the engine-generator set shall review and revise the generic O&M manual provided by the manufacturer so that only pertinent information relevant to this particular project is included. Non-relevant information, such as part lists, option lists, wiring diagrams, etc., should be crossed out if it can not be removed from the manuals.

3.7 MAINTENANCE SUPPORT PROGRAM

A. The manufacturer of the generator set shall provide a maintenance support program covering all routine service maintenance and repair of the engine generator set for a period of one year from the date of acceptance. The cost of the maintenance support program shall be shown individually, but must be included in the engine generator total bid price.

B. Under the maintenance support program contract, the generator set manufacturer shall be solely and completely responsible for correction of all deficiencies and defects and shall make any and all repairs, replacements, modifications and adjustments as malfunctions or failure occur.

C. The contract will cover the furnishing of all material, labor, testing equipment, load banks, tools, and transportation necessary to perform the preventative maintenance work herein described.

D. The vendor shall stock common replacement parts (i.e. filter, etc.) for service or repair work for engines, generators, control panels, switchgear, and automatic transfer switches.

E. The vendor shall be equipped with service technicians, tools, and transportation "on-call"; 24 hours a day, 365 days a year, to provide emergency service.

F. It is the responsibility of the vendor to notify the Owner of the scheduled maintenance interval at least two (2) weeks prior to the actual performance of their contractual obligations. The Owner reserves the right to witness the evaluation, testing, and maintenance of the equipment at its discretion. It is the responsibility of the vendor to coordinate testing and preventative maintenance on the existing operational system.

G. Three (3) copies of the evaluation, testing, and preventative maintenance work shall be submitted no later than (14) days following the completion of the service interval. All site documentation shall be typed.

H. The reports shall contain but shall not be limited to:
   1. Summary of findings and corrective work.
   2. Recommendations of repairs, overhauls, and other maintenance work that should be scheduled prior to the next scheduled service interval.
   3. Complete documentation of all test and inspection results on each significant item (i.e. engine, generator, transfer switch, and alarm functions.

I. As a minimum, the maintenance program shall include work as shown on the attached maintenance schedule. Any deletions from the schedule must be noted in writing as a part of the bid package.

END OF SECTION

ATTACHMENT: ENGINE-GENERATOR SET MAINTENANCE SCHEDULE (TYPICAL)

			6 mos.	1 yr.
Air Intake	Check	- for leaks	x	x
		- air cleaner restriction	x	x
		- piping and connections	x	x
	Clean	- crankcase breather	x	x
	or change	- air cleaner element	x	x
Fuel	Check	- for leaks	x	x
		- fuel level/take sample	x	x
		- governor linkage	x	x
		- fuel lines and connections	x	x
	Drain	- sediment from tanks & filter	x	x
	Change	- float tank breather		x
	Clean	- float tank breather		x
Exhaust	Check	- for leaks	x	x
		- for exhaust restriction	x	x
		- turbocharger bearing clearances		x
	Drain	- condensate trap	x	x
	Torque	- exhaust manifold & turbocharger cap-screws		x
	Clean	- turbocharger comp. wheel and diffuser		x
Electrical	Check	- battery charging system	x	x
		- battery electrolyte level and specific gravity/check battery voltage	x	x
		- safety controls and alarms	x	x
Engine Related				
	Check	- for unusual vibration	x	x
		- tighten mounting hardware		x
		- fan belt wear/cracking		
	Clean	- engine		x
	Grease	- fan pillow block bearings		x
	Test	- oil analysis or metals and cool-coolant for DCA/pH		x
	Change	- oil and filter and fuel filter		x
Main Generator				
	Check	- air inlet and outlet for		
		- restriction	x	x
		- windings & elect. connections		x
		- operation of generator heater strips		x
	Grease	- bearing		x
		- measure and record generator winding resistance		x
	Check/Clean	- generator	x	x

SECTION 26 90 25
CONTROL COMPONENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

1. Cellular Alarm Autodialer

1.2 DESCRIPTION OF WORKS

A. This section covers furnishing and installing one (1) cellular alarm autodialer and ancillary hardware and equipment.

B. The work and materials specified in this section include the system for alarm monitoring and notification.

C. The Contractor shall supply all interfacing equipment, appurtenances and accessories and all such devices that may be required for proper interfacing as part of the control system.

1.3 RELATED SECTIONS

A. Related Sections include but are not necessarily limited to:

1. Section 26 00 00 – Electrical General Provisions
2. Section 26 00 01 – Electrical Scope of Work
3. Section 26 00 02 – Basic Materials and Methods
4. Section 26 01 26 – Electrical Testing
5. Section 26 05 19 – Wire and Cable
6. Section 26 05 26 – Grounding
7. Section 26 05 33 – Raceways

1.4 STANDARDS AND REFERENCES

A. All materials and equipment specified herein shall within the scope of UL Examination Services, be approved by the Underwriter's Laboratories for the purpose for which they are used and shall bear the UL label.

B. All materials and equipment specified herein shall conform with all applicable NEMA, ANSI and IEEE Standards

C. All materials and equipment specified herein and their installation methods shall conform to the latest published version of the National Electrical Code, NEC, Oregon Electrical Specialty Code (OESC) and meet the City of Heppner, OR building code as currently adopted.

1.5 SUBMITTALS

A. Shop Drawings

1. See Section 26 00 00.

1.6 DELIVERY, STORAGE, AND HANDLING

A. See Section 26 00 00.

1.7 COORDINATION WITH CONTROLS AND OTHER EQUIPMENT

A. The Contractor shall be solely and completely responsible for coordination and integration of alarm system with the standby power system. The Contractor shall communicate directly with the Manufacturer(s) and supplier(s) of all related control equipment to determine all intended details of the equipment, which may influence or affect the control system. The Contractor shall determine all requirements for and shall cause integration of the control system and all other control equipment into a unified operating system. The Contractor shall define all requirements for all interfacing equipment and shall supply all appurtenances, accessories and all such devices, which may be required for proper interfacing as part of the control system.

PART 2 PRODUCTS

2.1 CELLULAR ALARM AUTODIALER

A. Cellular alarm autodialer shall have the following features:
   1. The Automatic Dialing Alarm Monitor shall monitor and control a minimum of 12 digital inputs, and 1 relay outputs and shall be capable of initiating a cellular call-out sequence, with programmable escalation, when any programmable condition using the I/O or a power failure is detected. The autodialer shall be capable of being programmed to dial at least four telephone numbers until the alarm is acknowledged. The dialer shall utilize voice synthesis for fault reporting, and respond to touch-tone commands from the user. The system shall provide programmable security.
   2. The unit shall be mounted in its own NEMA 4X plastic weatherproof enclosure with clear door, have two (2) latches, and be lockable for tamper protection. Also, include a battery backup for 8 hours minimum. A battery charger shall also be provided where battery backup is less than 8 hours. Provide a dry contact output for low battery voltage. Unit shall be UL. listed.
   3. Install a dedicated receptacle within the enclosure.
      a) For space constraints, install the dedicated receptacle in an individual NEMA 4X plastic weatherproof enclosure for the 12VDC plug-in power supply below the Autodialer enclosure. Connect via LT-FLEX.
   4. Cellular Modem compatible with Verizon.
   5. Antenna shall be mounted to the rack or autodialer enclosure, whichever provides greater service coverage.
   6. Ethernet port for local network connection.

B. Unit shall be Sensaphone Sentinel Monitoring System w/ Cellular Modem, or equal.

2.2 SPARE PARTS

A. In addition to spare parts mentioned elsewhere in this section, the Contractor shall supply the following spare parts for use by the Owner:
   1. One (1) 12VDC plug in power supply

PART 3 EXECUTION

3.1 OPERATING DEVICE LOCATION

A. Operating devices shall be mounted no higher than 6'-6" and no lower than 4'-0" above finished pad when panel is installed unless otherwise approved by the Engineer. Operating

devices with displays shall be mounted so that the display is between 5’-3” and 6’-0” above finished pad unless otherwise approved by the Engineer.

3.2 INSTALLATION

A. The control system shall be installed in accordance with the installation drawings and instructions prepared by the Contractor. Installation shall be performed by workers who are skilled and experienced in the installation of electrical instrumentation and control systems.

B. Installation shall include all elements and components of control system and all conduit and interconnecting wiring between all elements, components and alarming operators. All wiring between cabinets, sensors, and equipment shall be multiple color coded for ease of servicing. All terminations shall be made with solderless pressure connectors.

3.3 CALIBRATION AND START-UP

A. All components of the control system shall be calibrated by the Contractor after completion of installation. Each component shall be adjusted to be within the Manufacturer's required range and for the specific application.

B. Components that cannot be properly calibrated or that are found to exceed the Manufacturer's specified range or accuracy shall be removed and replaced at no additional cost to the Owner.

3.4 SYSTEM MAINTENANCE

A. The Contractor shall be solely and completely responsible for all maintenance of the system from time of start-up to the date of acceptance, by formal action of the Owner, of all work under the contract. The Contractor shall correct all deficiencies and defects and make any and all repairs, replacements, modifications, and adjustments as malfunctions or failures occur. The Contractor shall perform all such work required or considered to be required by the Owner to cause and maintain proper operation of the system and to properly maintain the system.

B. The Contractor shall anticipate that the Owner may delay acceptance of all work under the contract if, in the judgment of the Owner, malfunctions or failures in operation of the control system repeatedly occur after start-up. The Contractor shall not be entitled to an extension of time or to any claim for damages because of hindrances, delays or complications caused by or resulting from delay by the Owner in accepting the work because of malfunctions or failures in operation of the control system.

3.5 OPERATION AND MAINTENANCE TRAINING

A. See Section 26 00 00.

END OF SECTION