

**KETCHIKAN SHIPYARD MEDIUM VOLTAGE  
LOOP**

**INVITATION TO BID  
19014**



Alaska Industrial Development Export Authority  
813 W. Northern Lights Blvd  
Anchorage, Alaska 99503

Issue Date: SEPTEMBER 12, 2018

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(Federal-Aid Buildings)

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ALASKA INDUSTRIAL DEVELOPMENT EXPORT AUTHORITY

**INVITATION TO BID**

for Construction Contract

Date September 12, 2018

**Ketchikan Shipyard Medium Voltage Loop  
19014**

Location of Project: Ketchikan, Alaska  
Contracting Officer: Jake Tibbe  
Issuing Office: ALASKA INDUSTRIAL DEVELOPMENT EXPORT AUTHORITY (AUTHORITY)  
State Funded [ ] Federal Aid [x ]

Description of Work: This Federally funded project includes all labor, materials, equipment, and supervision required to relocate the electrical substation. There are four (4) additive alternates. Reference E1.0 Electrical Location Plan – Scope of Work Summary.

The Engineer's Estimate is between **\$2,000,000 - \$3,000,000**  
All work shall be substantially complete by: **240 Calendar days from Notice to Proceed.**  
Interim Completion dates, if applicable, will be shown in the General Requirements.

**Bidders are invited to submit sealed bids, in single copy, for furnishing all labor, equipment, and materials and for performing all work for the project described above. Bids will be opened publicly at 2:00 pm local time, in the Willow conference room, 813 West Northern Lights Blvd., Anchorage, Alaska on October 3, 2018.**

**SUBMISSION OF BIDS**

ALL BIDS INCLUDING ANY AMENDMENTS OR WITHDRAWALS MUST BE RECEIVED PRIOR TO BID OPENING. BIDS SHALL BE SUBMITTED ON THE FORMS FURNISHED AND MUST BE IN A SEALED ENVELOPE MARKED AS FOLLOWS:

<b>Bid for Project:</b> <b>Ketchikan Shipyard Medium Voltage Loop</b> <b>Project Number: 19014</b>	<b>ATTN: Jake Tibbe (Procurement</b> <b>Alaska Industrial Development Export Authority</b> <b>813 West Northern Lights Blvd.</b> <b>Anchorage, AK 99503</b>
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Bids, amendments or withdrawals transmitted by mail must be received in the above specified post office box no later than 7 hours prior to the scheduled time of bid opening. Hand-delivered bids, amendments or withdrawals must be received by the **Front Desk of the Alaska Industrial Development Export Authority**, prior to the scheduled time of bid opening. Emailed bid amendments must be addressed to **Jake Tibbe**, Email: [jtibbe@aidea.org](mailto:jtibbe@aidea.org)

*A bid guaranty is required with each bid in the amount of 5% of the amount bid. (Alternate bid items as well as supplemental bid items appearing on the bid schedule shall be included as part of the total amount bid when determining the amount of bid guaranty required for the project.)*

The Authority hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this Invitation, Disadvantaged Business Enterprises (DBEs) will be afforded full opportunity to submit bids and will not be discriminated against on the grounds of race, color, national origin, or sex in consideration for an award.

## NOTICE TO BIDDERS

Bidders are hereby notified that data to assist in preparing bids is available as follows:

See attached Special Notice to Bidders for this project.

Electronic Plans and Specifications may be ordered, for the price of **\$0.00** from:

**Alaska Industrial Development Export Authority**  
**813 West Northern Lights Blvd.**  
**Anchorage, AK 99503**

Phone: (907) 771-3990

All questions relating to design features, constructability, quantities, or other technical aspects of the project should be directed to the following. Bidders requesting assistance in viewing the project must make arrangements at least 48 hours in advance with:

**Rich Wooten, CDT, CPSM, PMP**

Phone: (907) 771- 3986

Email: [rwooten@aidea.org](mailto:rwooten@aidea.org)

All questions concerning bidding procedures should be directed to:

**Jake Tibbe**  
**Contracting Officer**  
**813 West Northern Lights Blvd.**  
**Anchorage, AK 99503**

Phone: (907) 771-3990 Email: [jtibbe@AIDEA.Org](mailto:jtibbe@AIDEA.Org)

**The Bid Calendar, Planholder lists, and Bid Results information are available on the Internet at: [www.aidea.org](http://www.aidea.org) under Procurement Opportunities.**

**Reminder: 3 AAC 100.220 requires all Bidders to have a valid Alaska Business License and an Alaska Contractor's Certificate of Registration prior to award. To qualify as an Alaska bidder under 3 AAC 100.220, a bidder shall have a valid Alaska business license at time designated in the invitation to bid for bid opening.**

ALASKA INDUSTRIAL DEVELOPMENT EXPORT AUTHORITY

**INFORMATION TO BIDDERS**

The Authority is concerned over the manner in which bids are submitted. Bidders are requested to study and follow the bid assembly instructions as to the method and form for submitting bids so there will be no reason to reject a bid.

**EXAMINATION OF CONTRACT REQUIREMENTS**

Bidders are expected to examine carefully the plans, specifications and all other documents incorporated in the contract to determine the requirements thereof before preparing bids.

Any explanation desired by bidders regarding the meaning or interpretation of drawings and specifications must be requested in writing and with sufficient time allowed for a reply to reach them before the submission of their bids. Oral explanations or instructions given before the award of the contract will not be binding. Any interpretation made will be in the form of an addendum to the specifications or drawings and will be furnished to all bidders and its receipt by the bidder shall be acknowledged.

**CONDITIONS AT SITE OF WORK**

Bidders are expected to examine the available site information to ascertain pertinent local conditions such as the location, accessibility and character of the site, labor conditions, the character and extent of the existing work within or adjacent thereto, and any other work being performed thereon.

**PREPARATION OF BIDS**

- (a) Bids shall be submitted on the forms furnished, and must be manually signed in ink. The person signing the proposal must initial any erasures or changes made to the bid.
- (b) The bid schedule will provide for quotation of a price or prices for one or more pay items which may include unit price or lump sum items and alternative, optional or supplemental price schedules or a combination thereof which will result in a total bid amount for the proposed construction.

Where required on the bid form, bidders must quote on all items and **THEY ARE WARNED** that failure to do so will disqualify them. When quotations on all items are not required, bidders should insert the words "no bid" in the space provided for any item not requiring a quotation and for which no quotation is made.

- (c) The bidder shall specify the price or prices bid in figures. On unit price contracts the bidder shall also show the products of the respective unit prices and quantities written in figures in the column provided for the purpose and the total amount of the proposal obtained by adding the amounts of the several items. All the figures shall be in ink or typed.
- (d) Neither conditional nor alternative bids will be considered unless called for.
- (e) Unless specifically called for, telegraphic or telefacsimile bids will not be considered.
- (f) Bid Schedule form should be enclosed in a separate sealed envelope and enclosed with all other bidding forms required at the opening.

## **BID SECURITY**

All bids shall be accompanied by a bid security in the form of an acceptable Bid Bond (Form 25D-14), or a certified check, cashier's check or money order made payable to the Alaska Industrial Development Export Authority. The amount of the bid security is specified on the Invitation To Bid.

Bid Bonds must be accompanied by a legible Power of Attorney.

If the bidder fails to furnish an acceptable bid security with the bid, the bid shall be rejected as non-responsive. Telegraphic notification of execution of Bid Bond does not meet the requirements of bid security accompanying the bid. An individual surety will not be accepted as a bid security.

The Authority will hold the bid securities of the two lowest bidders until the Contract has been executed, after which they will be returned. All other bid securities will be returned as soon as practicable.

## **BIDDERS QUALIFICATIONS**

Before a bid is considered for award, the bidder may be requested by the Authority to submit a statement of facts, in detail, as to his previous experience in performing comparable work, his business and technical organization, financial resources, and plant available to be used in performing the work.

### **A. Minimum Qualifications:**

#### **1. Cable technician:**

- a. Three (3) years' experience in handling, terminating, and splicing medium-voltage cables.
- b. Specifically trained by a factory representative on the terminations and splices to be used on the project:
- c) If not trained on the projects to be used, on-site training by the factory representative shall be performed before any terminations or splices are made.

#### **2. Cable testing:**

- a) The NETA certified independent testing organization shall have been engaged in full practice in the final inspection, testing, calibration, and adjusting of electrical distribution systems, for a minimum of five (5) years.
- b) The NETA certified independent testing organization shall have a calibration program with accuracy traceable every six (6) months in an unbroken chain, to NIST.
- c) The NETQA certified independent testing organization shall have a designated safety representative for the project:
- d) The standards followed shall include OSHA, NFPA 70E, and IEEE 510.
- e) Inspection, testing, and testing equipment calibration shall be performed by an engineering technician, certified by a national organization, such as the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies, with a minimum of five (5) years' experience inspecting and testing medium voltage power cables;
- f) Information on the certified engineering technician shall be submitted to the Engineer for approval prior to the start of work.
- g) The qualifications of the NETA certified independent testing organization shall be submitted for approval prior to the start of testing:

1) Full membership to the InterNational Electrical Testing Association constitutes proof of meeting all of the above requirements.

Bidders either directly or through their suppliers and subcontractors, if requested, must clearly demonstrate they have experience listed above. Bidders who fail to adequately demonstrate meeting these requirements may be determined to be non-responsive and their bid may be rejected.

## **SUBMISSION OF BIDS**

Bids must be submitted as directed on the Invitation To Bid. Do not include in the envelope any bids for other work.

## **ADDENDA REQUIREMENTS**

The bid documents provide for acknowledgement individually of all addenda to the drawings and/or specifications on the signature page of the Proposal. All addenda shall be acknowledged on the Proposal or by telegram prior to the scheduled time of bid opening. If the bidder received no addenda, the word "None" should be shown as specified.

Every effort will be made by the Authority to insure that Contractors receive all addenda when issued. Addenda will be issued to the individual or company to whom bidding documents were issued. Addenda may be issued by any reasonable method such as hand delivery, mail, telefacsimile, telegraph, courier, and in special circumstances by phone. Addenda will be issued to the address, telefacsimile number or phone number as stated on the planholder's list unless picked up in person or included with the bid documents. It is the bidder's responsibility to insure that he has received all addenda affecting the Invitation To Bid. No claim or protest will be allowed based on the bidder's allegation that he did not receive all of the addenda for an Invitation To Bid.

All questions must be received 72 hours before the bid opening. Questions submitted after the deadline may be rejected by the Authority.

## **WITHDRAWAL OR REVISION OF BIDS**

A bidder may withdraw or revise a bid after it has been deposited with the Authority, provided that the request for such withdrawal or revision is received by the designated office, in writing, by telegram, or by telefacsimile, before the time set for opening of bids.

Emailed or telefacsimile modifications shall include both the modification of the unit bid price and the total modification of each item modified, but shall not reveal the amount of the total original or revised bids. Form 25D-16 shall be used to submit such modifications.

## **RECEIPT AND OPENING OF BIDS**

- (a) The Authority must receive all bids, including any amendment or withdrawal prior to the scheduled time of bid opening. Any bid, amendment, or withdrawal that has not actually been received by the Authority prior to the time of the scheduled bid opening will not be considered.
- (b) No responsibility will be attached to any officer or employee of the Authority for the premature opening of, or failure to open, a bid improperly addressed or identified.
- (c) The Authority reserves the right to waive any technicality in bids received when such waiver is in the interest of the State.



## **BIDDERS PRESENT**

At the time fixed for bid opening, bids will be publicly opened and read for the information of bidders and others properly interested, who may be present either in person or by representative. The amount of the bid and the name of the bidder shall be compiled and distributed as soon as possible after bid opening. Bids are not open for public inspection until after the Notice of Intent to Award is issued.

## **BIDDERS INTERESTED IN MORE THAN ONE BID**

If more than one bid is offered by any one party, by or in the name of his or their clerk or partner, all such bids will be rejected. A party who has quoted prices to a bidder is not thereby disqualified from quoting prices to other bidders or from submitting a bid directly for the work.

## **REJECTION OF BIDS**

The Authority reserves the right to reject any and all bids when such rejection is in the best interest of the State; to reject the bid of a bidder who has previously failed to perform properly, or complete on time, contracts of a similar nature; to reject the bid of a bidder who is not, in the opinion of the Contracting Officer, in a position to perform the contract; and to reject a bid as non-responsive where the bidder fails to furnish the required documents, fails to complete required documents in the manner directed, or makes unauthorized alterations to the bid documents.

## **AWARD OF CONTRACT**

- (a) The letter of award, if the contract is to be awarded, will be issued to the lowest responsible and responsive bidder as soon as practical and usually within 40 calendar days after opening of proposals.
- (b) The successful bidder will be notified of the Authority's intent to award the contract and requested to execute certain documents, including the contract form and bonds.
- (c) The contract will be awarded to the successful bidder following receipt by the Authority of all required documents, properly executed, within the time specified in the intent to award. Failure to enter into a contract within the specified time shall be grounds for forfeiture of the bid security and consideration of the second low bidder for award.

# ALASKA INDUSTRIAL DEVELOPMENT EXPORT AUTHORITY

## SUPPLEMENTARY INFORMATION TO BIDDERS

This document modifies or adds to the provisions of Alaska Industrial Development Export Authority's form 25D-3, INFORMATION TO BIDDERS.

Following subject area "REJECTION OF BIDS", add the following subject area:

### "CONSIDERATION OF PROPOSALS

After the Proposals are opened and read, they will be compared on the basis identified on the bid schedule and the apparent low Bidder announced. The apparent low Bidder shall, within 5 working days following identification as the apparent low Bidder, submit a list of all firms with which the prime CONTRACTOR intends to execute subcontracts for the performance of the Contract. The list shall include the name, business address, Alaska business license number and contractor's registration number of each proposed Subcontractor.

Upon confirmation of the contents of the proposal the low Bidder will be identified by the AUTHORITY in writing. If the low Bidder differs from the apparent low Bidder then the requirements for Subcontractor listing, as noted above, shall become effective upon the low Bidder at the time of identification.

If a Bidder fails to list a Subcontractor or lists more than one Subcontractor for the same portion of Work and the value of that Work is in excess of one-half of one percent of the total bid, the Bidder agrees that it shall be considered to have agreed to perform that portion of Work without the use of a Subcontractor and to have represented that the Bidder is qualified to perform the Work.

A Bidder who attempts to circumvent the requirements of this section by listing as a Subcontractor another contractor who, in turn, sublets the majority of the Work required under the Contract, violates this section.

If a Contract is awarded to a Bidder who violates this section, the Bidder agrees that the Contracting Officer may:

- (1) cancel the Contract without any damages accruing to the State; or
- (2) after notice and a hearing, assess a penalty on the Bidder in an amount that does not exceed 10 percent of the value of the Subcontract at issue.

A Bidder may replace a listed Subcontractor who:

- (1) fails to comply with AS 08.18;
- (2) files for bankruptcy or becomes insolvent;
- (3) fails to execute a contract with the Bidder involving performance of the Work for which the Subcontractor was listed and the Bidder acted in good faith;
- (4) fails to obtain bonding;
- (5) fails to obtain insurance acceptable to the State;
- (6) fails to perform the Contract with the Bidder involving Work for which the Subcontractor was listed;
- (7) must be substituted in order for the prime CONTRACTOR to satisfy required State and Federal affirmative action requirements;
- (8) refuses to agree or abide with the bidder's labor agreement; or
- (9) is determined by the Contracting Officer to be nonresponsive."

Modify subject area "AWARD OF CONTRACT" as follows:

Subparagraph (a) substitute the word "generally" for the phrase "as soon as practical and"

Subparagraph (b) delete and substitute the following:

"All Bidders will be notified of the AUTHORITY's intent to Award the Contract and the successful Bidder will be requested to execute certain documents, including the Contract form and bonds."

### **Special Notice to Bidders**

1. A non-mandatory pre-bid meeting is scheduled for September 25th, 2018, 1:00 pm, in the Aspen Conference room. This is not a mandatory meeting, and there will not be a scheduled site visit prior to the bid opening. Attend by teleconference dial 1-888-585-9008 and when prompted enter code #434756425.
2. Bidders are hereby notified that the following data to assist in preparing bids is available for viewing online:
  - a. KSY Power Logger Load Data Summary

## REQUIRED DOCUMENTS

**REQUIRED FOR BID.** Bids will not be considered if the following documents are not completely filled out and submitted at the time of bidding:

1. **Bid Form (Form 25D-9)**
  2. **Bid Schedule**
  3. **Bid Security**
  4. Any bid revisions must be submitted by the bidder prior to bid opening on the following form:  
**Bid Modification (Form 25D-16)**
  5. On Federal-aid transit projects: **Buy America Certificate (Form 25D-61)**
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**REQUIRED AFTER NOTICE OF APPARENT LOW BIDDER.** The apparent low bidder is required to complete and submit the following document within 5 working days after receipt of written notification:

1. **Subcontractor List (Form 25D-5)**
  2. **DBE Utilization Report (Form 25A-325C)**
  3. In accordance with specification Section 120, the successful bidder shall submit documentation of good faith efforts by submitting the following:  
**Summary of Good Faith Effort Documentation (Form 25A-332A), and**  
**Contact Reports (Form 25A-321A),** as required the initial contact must be made within 7 calendar days prior to bid opening.
  4. For each DBE to be used on the project, submit a **DBE Commitment (Form 25A-326)**
- 

**REQUIRED FOR AWARD.** In order to be awarded the contract, the successful bidder must completely fill out and submit the following documents within the time specified in the intent to award letter:

1. **Construction Contract (Form 25D-10A)**
2. **Payment Bond (Form 25D-12)**
3. **Performance Bond (Form 25D-13)**
4. **Contractor's Questionnaire (Form 25D-8)**
6. **Certificate of Insurance** (from carrier)
7. **EEO-1 Certification (Form 25A-304)**



## FEDERAL EEO BID CONDITIONS

### STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246). FOR ALL NON-EXEMPT FEDERAL AND FEDERALLY-ASSISTED CONSTRUCTION CONTRACTS TO BE AWARDED IN THE STATE OF ALASKA

1. Definitions. As used in these specifications:
  - a. “**Covered area**” means the geographical area described in the solicitation from which this contract resulted;
  - b. “**Director**” means Director, Office of Federal Contract Compliance Programs (OFCCP), United States Department of Labor (DOL), or any persons to whom the Director delegates authority;
  - c. “**Employer**” identification number” means the Federal Social Security number used on the Employer’s Quarterly Federal Tax Return, U.S. Treasury Department Form 941.
  - d. “**Minority**” includes:
    - (1) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
    - (2) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish culture or origin, regardless of race);
    - (3) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
    - (4) American Indian or Alaska Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).
2. Whenever the Contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.
3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the DOL in the covered area, either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades that have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or subcontractors toward a goal in an approved Plan does not excuse any covered Contractor’s or subcontractor’s failure to make good faith efforts to achieve the Plan goals and timetables.
4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7(a) through 7(p) of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.

Covered construction contractors performing construction work in geographical areas where they do not have a federal or federally-assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any OFCCP office or from federal procurement contracting officers.

5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.
6. In order for the non-working training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period of an approved training program and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities.
7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:
  - a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligations to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.
  - b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.
  - c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.
  - d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
  - e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the DOL. The Contractor shall provide notice of these programs to the sources compiled under 7(b) above.
  - f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

- g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with on-site supervisory personnel such as Superintendent, general foreman, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and dispositions of the subject matter.
  - h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.
  - i. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.
  - j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.
  - k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.
  - l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
  - m. Ensure that seniority practices, job classifications, work assignments and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.
  - n. Ensure that all facilities and company activities are nonsegregated except that separate or single-used toilet, necessary changing facilities and necessary sleeping facilities shall be provided to assure privacy between the sexes.
  - o. Document and maintain a record of all solicitations of offers for subcontractors from minority and female construction contractors and suppliers, including circulations of solicitations to minority and female contractor associations and other business associations.
  - p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.
8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations 7(a) through 7(p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the Contractor is a member and participant, may be asserted as fulfilling any or more of its obligations under 7(a) through 7(p) of these specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female work force participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.



9. A single goal for minorities and a separate goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized.)
10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.
11. The Contractor shall not enter into any subcontract with any person or firm debarred from government contracts pursuant to Executive Order 11246.
12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the OFCCP. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.
13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunities. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.
14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic apprentice, trainees, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that the existing records satisfy this requirement, Contractors shall not be required to maintain separate records.
15. Nothing herein provided shall be construed as a limitation upon the application of other laws that establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Programs).
16. The Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.
17. The Contractor shall provide written notification to the Department, for all subcontracts documents as follows: the name, address and telephone number of subcontractors and their employer identification number; the estimated dollar amount of the subcontracts; estimated starting and completion dates of the subcontracts; and the geographical area in which the contract is to be performed.  
  
This written notification shall be required for all construction subcontracts in excess of \$10,000 at any tier for construction work under the contract resulting from this project's solicitation.
18. As used in the Bid Notice, and in the contract resulting from this project's solicitation, the "covered area" is the State of Alaska.

STATE OF ALASKA  
ALASKA INDUSTRIAL DEVELOPMENT EXPORT AUTHORITY

**CONTACT REPORT**  
Federal-Aid Contracts

**Ketchikan Shipyard Medium Voltage Loop  
19014**

Specific Work or Materials (by pay Item): \_\_\_\_\_

**DBE Firm Contacted:**

\_\_\_\_\_  
Name Address ( ) Phone Number

**A. INITIAL CONTACT:** (See important contact information on instruction sheet)

Method:

1. Date \_\_\_\_\_  Phone  Publication  Email  FAX  Other  
2. Person \_\_\_\_\_  
Contacted \_\_\_\_\_  
Name Title

3. DBE's Response: Date: \_\_\_\_\_ Method:  Phone  Email  FAX  Other  
 Submitted an acceptable sub-bid. (If sub-bid accepted, skip to Section D)  
 Not interested: Indicate Reason(s) \_\_\_\_\_  
 Needs more information: Date Prime provided requested information \_\_\_\_\_  
 Will provide quote by: Date \_\_\_\_\_  
 Received unacceptable sub-bid (complete Section C)

**B. FOLLOW-UP CONTACT:**

Method:

1. Date \_\_\_\_\_  Phone  Publication  Email  FAX  Other  
2. Person \_\_\_\_\_  
Contacted \_\_\_\_\_  
Name Title

3. DBE's Response: Date: \_\_\_\_\_ Method:  Phone  Email  FAX  Other  
 Submitted an acceptable sub-bid. (If sub-bid accepted, skip to Section D)  
 Received unacceptable sub-bid (complete Section C)  
 Other result: \_\_\_\_\_

**C. EXPLANATION OF FAILURE TO ACHIEVE AN ACCEPTABLE SUB-BID:**

1. Were the following required efforts made?  
a.  Yes  No Identified specific items of work, products, materials, etc. when asking for quote(s).  
b.  Yes  No Offered assistance in acquiring necessary bonding, insurance, and business development related assistance.  
c.  Yes  No Provided all appropriate information concerning the specific work items or materials.
2. Was the DBE's quote non-competitive?  Yes  No
3. Was the DBE unable to perform in some capacity?  Yes  No If "Yes", explain: \_\_\_\_\_

**D. CERTIFICATION:** I certify that the information provided above is accurate and that efforts to solicit sub-bids were made in good faith.

\_\_\_\_\_  
Signature of Company Representative

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

\_\_\_\_\_  
Name of DOT&PF Reviewer

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

## INSTRUCTIONS

**Project Name and Number:** Enter project name and number as they appear on bid documents.

**Work or Materials:** Identify the specific work item or material that you requested this firm to furnish.

**Firm Contacted:** Enter name of firm as it appears in the current DOT&PF DBE directory.

**Address:** Enter address of firm contacted.

**Phone Number:** Enter phone number of firm contacted.

**A. INITIAL CONTACT** (Must be made at least seven calendar days prior to bid opening.)

1. **Date and Method of Initial Contact:** Indicate the method and date that actual contact was made or the date correspondence was postmarked. Leaving a "please call me" message does not constitute a contact. Attach a copy of dated letter or fax.
2. **Name and Title of Person Contacted.** Enter name and title of company representative with whom you corresponded or discussed submitting a sub-bid.
3. **DBE's Response:** Indicate one or more of the responses listed. If a firm bid was received and accepted, skip to section D.

### B. FOLLOW-UP CONTACT

If no response or an inconclusive response was received from the initial contact, a follow-up contact is required to determine for a certainty that the firm does not intend to submit a sub-bid or to conclude discussions with a sub-bid submittal.

1. **Date and Method of Follow-up Contact:** Indicate the method and date that actual contact was made or the date correspondence was postmarked. Leaving a "please call me" message does not constitute a contact. Attach a copy of dated letter or fax.
2. **Name and Title of Person Contacted.** Enter name and title of company representative with whom you corresponded or discussed submitting a sub-bid.
3. **DBE's Response:** Indicate one or more of the responses listed. If a firm bid was received and accepted, skip to section D.

### C. EXPLANATION OF FAILURE TO ACHIEVE AN ACCEPTABLE SUB-BID

1. A NO response to items 1a., b., or c. will result in rejection of this contact. Be specific on results of discussions.
2. A YES answer to item 2. is grounds for rejecting a DBE sub-bid.
3. A YES answer to item 3. is grounds for rejecting a DBE sub-bid, only if the inability to perform is in an area of work specifically identified as a sub-item under the applicable bid item.

### D. CERTIFICATION

This certification of accuracy and good faith by the Contractor will be verified by contact with the listed firm. Falsification of information on the DBE Contact Report is grounds for debarment action under AS 36.30.640(4).

STATE OF ALASKA  
ALASKA INDUSTRIAL DEVELOPMENT EXPORT AUTHORITY

**DISADVANTAGED BUSINESS ENTERPRISE  
UTILIZATION REPORT**

Federal-Aid Contracts

**Ketchikan Shipyard Medium Voltage Loop  
19014**

**The undersigned hereby certifies on behalf of the bidder that:**

- A. It  is  is not a DOT&PF certified DBE or DBE joint venture.
- B. It  has  has not met the DBE Goal for the project. If it has not met the goal, the required documentation of sufficient good faith efforts  is  is not attached hereto.
- C. Listed below are the **certified** DBEs to be used in meeting the DBE goal. Included are the firm name, bid items or portions of work to be performed by the item number, type of DBE credit claimed, and the creditable dollar amount to be counted toward the goal.

FIRM NAME	BID ITEM, WORK, OR PRODUCT	SUBCONTRACT AMOUNT*	TYPE OF CREDIT	CREDITABLE DOLLAR AMOUNT**
				\$
				\$
				\$
				\$
				\$
				\$

\*or expenditure amount or fee/commission amount. \*\* (Subcontract amount x Goal Participation %).

If more room necessary, submit additional, signed copies of this form.

Total creditable DBE Utilization Amount	\$ _____
Basic Bid Amount	\$ _____
DBE Utilization % of Basic Bid Amount	_____ %
DBE Project Goal	0 _____ %

\_\_\_\_\_  
Signature of Authorized Company Representative

\_\_\_\_\_  
Title

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

\_\_\_\_\_  
Company Address (Street or PO Box, City, State, Zip)

\_\_\_\_\_  
Date

( )  
\_\_\_\_\_  
Phone Number



STATE OF ALASKA  
ALASKA INDUSTRIAL DEVELOPMENT EXPORT AUTHORITY

**SUMMARY OF GOOD FAITH EFFORT DOCUMENTATION**  
Federal-Aid Contracts

**Ketchikan Shipyard Medium Voltage Loop  
19014**

**Contractor:** \_\_\_\_\_

List **all** items considered for DBE utilization. GFE requires at a minimum that the Contractor consider all items identified on Form 25A-324.

a. MATERIAL OR SPECIFIC ITEM OF WORK (SPECIFY PAY ITEM)	b. ACCEPTABLE DBE QUOTE RECEIVED <sup>1</sup>	c. # OF DBEs CONTACTED IN DBE DIRECTORY	d. # OF DBEs THAT RESPONDED <sup>2</sup>	e. # OF DBE QUOTES RECEIVED
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				

- 1. Check if acceptable DBE quote was received (if so, skip c, d, and e)
- 2. Attach completed Contact Reports, Form 25A-321A

LIST ADDITIONAL ITEMS ON REVERSE SIDE

a. MATERIAL OR SPECIFIC ITEM OF WORK (SPECIFY PAY ITEM)	b. ACCEPTABLE DBE QUOTE RECEIVED <sup>1</sup>	c. # OF DBEs CONTACTED IN DBE DIRECTORY	d. # OF DBEs THAT RESPONDED <sup>2</sup>	e. # OF DBE QUOTES RECEIVED
9.				
10.				
11.				
12.				
13.				
14.				
15.				

- 1. Check if acceptable DBE quote was received (if so, skip c, d, and e)
- 2. Attach completed Contact Reports, Form 25A-321A

Comments:

STATE OF ALASKA  
ALASKA INDUSTRIAL DEVELOPMENT EXPORT AUTHORITY

**EEO-1 CERTIFICATION**  
Federal-Aid Contracts

**Ketchikan Shipyard Medium Voltage Loop  
19014**

This certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor [41 CFR 60-1.7 (b) (1)] and must be completed by the successful Bidder and each proposed Subcontractor participating in this contract.

**PLEASE CHECK APPROPRIATE BOXES**

The  Bidder  Proposed Subcontractor hereby CERTIFIES:

**PART A.** Bidders and proposed Subcontractors with 50 or more year-round employees and a federal contract amounting to \$50,000 or more are required to submit one federal Standard Report Form 100 during each year that the two conditions exist (50 employees and a \$50,000 federal contract).

The company named below (Part C) is exempt from the requirements of submitting the Standard Report Form 100 this year.

NO (go to PART B)  YES (go to PART C)

Instructions and blank Standard Report Form 100's may be obtained from a local U.S. Department of Labor office, or by writing to:

The Joint Reporting Committee  
P.O. Box 779  
Norfolk, Virginia 23501

Telephone number: (757) 461-1213

**PART B.** The company named below has submitted the Standard Report Form 100 this year.

NO  YES

**Note:** Bidders and proposed Subcontractors who have not filed the required Standard Report Form 100 and are not exempt from filing requirements will not be awarded this contract or subcontract until Form 100 has been filed for the current year ending June 30.

**PART C.**

\_\_\_\_\_  
Signature of Authorized Company Representative

\_\_\_\_\_  
Title

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

\_\_\_\_\_  
Company Address (Street or PO Box, City, State, Zip)

( )

\_\_\_\_\_  
Date

\_\_\_\_\_  
Phone Number



**PROPOSAL**  
of

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

\_\_\_\_\_

**To the CONTRACTING OFFICER, ALASKA INDUSTRIAL DEVELOPMENT EXPORT AUTHORITY:**

In compliance with your Invitation To Bid dated **September 12, 2018**, the Undersigned proposes to furnish and deliver all the materials and do all the work and labor required in the construction of Project:

**Ketchikan Shipyard Medium Voltage Loop**

**Project No. 19014**

Located at **Ketchikan, Alaska**, according to the plans and specifications and for the amount and prices named herein as indicated on the Bid Schedule consisting of **2** sheet(s), which is made a part of this Bid.

The Undersigned declares that he has carefully examined the contract requirements and that he has made a personal examination of the site of the work; that he understands that the quantities, where such are specified in the Bid Schedule or on the plans for this project, are approximate only and subject to increase or decrease, and that he is willing to perform increased or decreased quantities of work at unit prices bid under the conditions set forth in the Contract Documents.

The Undersigned hereby agrees to execute the said contract and bonds within fifteen calendar days, or such further time as may be allowed in writing by the Contracting Officer, after receiving notification of the acceptance of this proposal, and it is hereby mutually understood and agreed that in case the Undersigned does not, the accompanying bid guarantee shall be forfeited to the Alaska Industrial Development Export Authority, as liquidated damages, and the said Contracting officer may proceed to award the contract to others.

The Undersigned agrees to commence the work within 10 calendar days after the effective date of Notice to Proceed and to substantially complete the work within **240 calendar days from Notice to Proceed**, unless extended in writing by the Contracting Officer. Final inspection and completion shall be **30 calendar days after the Substantial Completion date**, unless extended in writing by the Contracting Officer.

The Undersigned proposes to furnish Payment Bond in the amount of 100% (of the contract) and Performance Bond in the amount of 100% (of the contract), as surety conditioned for the full, complete and faithful performance of this contract.

The Undersigned acknowledges receipt of the following addenda to the drawings and/or specifications (give number and date of each).

Addendum Number	Date Issued

Addendum Number	Date Issued

Addendum Number	Date Issued

**NON-COLLUSION AFFIDAVIT**

The Undersigned declares, under penalty of perjury under the laws of the United States, that neither he nor the firm, association, or corporation of which he is a member, has, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with this bid.

The Undersigned has read the foregoing proposal and hereby agrees to the conditions stated therein by affixing his signature below:

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Name and Title of Person Signing

\_\_\_\_\_  
Telephone Number

\_\_\_\_\_  
Email

**BID SCHEDULE**

**Ketchikan Shipyard – Medium Voltage Loop**

**Project No. 19014**

Bidders Please Note: Before preparing this bid schedule, read carefully, "Information to Bidders", and the following:

The Bidder shall insert a fixed price in figures opposite each pay item that appears in the bid schedule to furnish all labor, material, equipment, supervision and provide all work for each item listed. No price is to be entered or tendered for any item not appearing in the bid schedule.

Contract award shall be made on the basis of the total Base Bid plus additive alternates as selected by AIDEA. If Bid Alternates are included in the Bid Documents, the AIDEA reserves the right to award some, none, or all of the alternates. Alternates may be awarded in any order in the best interest of the AIDEA.

Conditioned or qualified bids will be considered non-responsive.

**Base Bid**

Bid Item	Description	Lump Sum Price
1	Construct Base Bid	\$
<b>Total Base Bid</b>		

**Additive Alternates:**

Bid Item	Description	Lump Sum Price
2	Construct Additive Alternate #1	\$
3	Construct Additive Alternate #2	\$
4	Construct Additive Alternate #3	\$
5	Construct Additive Alternate #4	\$
<b>TOTAL BID: SUM OF BASE BID AND ADDITIVE ALTERNATES</b>		\$

**Bidder is required to bid on all bid items, including all Additive Alternates.**

**See Specification Section 01 11 13 Summary of Work for detailed descriptions of each bid item and additive alternate.**

\_\_\_\_\_  
Contractor's Name (Printed)

\_\_\_\_\_  
Alaska Contractor's Registration #

\_\_\_\_\_  
Expires

\_\_\_\_\_  
Alaska Business License #

\_\_\_\_\_  
Expires

\_\_\_\_\_  
Email

ALASKA INDUSTRIAL DEVELOPMENT EXPORT AUTHORITY

**BID BOND**

For

**Ketchikan Shipyard Medium Voltage Loop  
19014**

DATE BOND EXECUTED: \_\_\_\_\_

PRINCIPAL (Legal name and business address):

TYPE OF ORGANIZATION:

	[ ] Individual	[ ] Partnership
	[ ] Joint Venture	[ ] Corporation
STATE OF INCORPORATION:		

SURETY(IES) (Name and business address):

<b>A.</b>	<b>B.</b>	<b>C.</b>

PENAL SUM OF BOND:	DATE OF BID:

We, the PRINCIPAL and SURETY above named, are held and firmly bound to the State (State of Alaska), in the penal sum of the amount stated above, for the payment of which sum will be made, we bind ourselves and our legal representatives and successors, jointly and severally, by this instrument.

THE CONDITION OF THE FOREGOING OBLIGATION is that the Principal has submitted the accompanying bid in writing, date as shown above, on the above-referenced Project in accordance with contract documents filed in the office of the Contracting Officer, and under the Invitation To Bid therefore, and is required to furnish a bond in the amount stated above.

If the Principal's bid is accepted and he is offered the proposed contract for award, and if the Principal fails to enter into the contract, then the obligation to the State created by this bond shall be in full force and effect.

If the Principal enters into the contract, then the foregoing obligation is null and void.

**PRINCIPAL**

Signature(s)	1.	2.	3.
Name(s) & Title(s) (Typed)	1.	2.	3.

Corporate Seal

See Instructions on Reverse

**CORPORATE SURETY(IES)**

<b>Surety A</b>	Name of Corporation	State of Incorporation	Liability Limit \$
Signature(s)	1.	2.	Corporate Seal
Name(s) & Titles (Typed)	1.	2.	

<b>Surety B</b>	Name of Corporation	State of Incorporation	Liability Limit \$
Signature(s)	1.	2.	Corporate Seal
Name(s) & Titles (Typed)	1.	2.	

<b>Surety C</b>	Name of Corporation	State of Incorporation	Liability Limit \$
Signature(s)	1.	2.	Corporate Seal
Name(s) & Titles (Typed)	1.	2.	

### INSTRUCTIONS

1. This form shall be used whenever a bid bond is submitted.
2. Insert the full legal name and business address of the Principal in the space designated. If the Principal is a partnership or joint venture, the names of all principal parties must be included (e.g., "Smith Construction, Inc. and Jones Contracting, Inc. DBA Smith/Jones Builders, a joint venture"). If the Principal is a corporation, the name of the state in which incorporated shall be inserted in the space provided.
3. Insert the full legal name and business address of the Surety in the space designated. The Surety on the bond may be any corporation or partnership authorized to do business in Alaska as an insurer under AS 21.09. Individual sureties will not be accepted.
4. The penal amount of the bond may be shown either as an amount (in words and figures) or as a percent of the contract bid price (a not-to-exceed amount may be included).
5. The scheduled bid opening date shall be entered in the space marked Date of Bid.
6. The bond shall be executed by authorized representatives of the Principal and Surety. Corporations executing the bond shall also affix their corporate seal.
7. Any person signing in a representative capacity (e.g., an attorney-in-fact) must furnish evidence of authority if that representative is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved.
8. The states of incorporation and the limits of liability of each surety shall be indicated in the spaces provided.
9. The date that bond is executed must not be later than the bid opening date.







**List of supplies and materials that the U.S. Government has determined are not produced in the United States in sufficient and reasonably available quantities and of sufficient quality. (Jan 1991)**

Acetylene, black	Manganese
Agar, bulk	Menthol, natural bulk
Anise	Mica
Antimony, as metal or oxide	Microprocessor chips (brought onto a construction site as separate units for incorporation into building systems during construction or repair and alteration of real property.)
Asbestos, amosite, chrysolite, and Crocidolite	Nickel, primary, in ingots, pigs, shots, cathodes, or similar forms; nickel oxide and nickel salts.
Bananas	Nitroguanidine (also known as picrite)
Bauxite	Nux vomica, crude
Beef, corned, canned	Oiticica oil
Beef extract	Olive oil Olives (green), pitted or unpitted, or stuffed, in bulk.
Bephenium Hydroxynapthoate	Opium, crude
Bismuth	Oranges, mandarin, canned
Books, trade, text, technical, or scientific; newspapers; pamphlets; magazines; periodicals; printed briefs and films; not printed in the United States and for which domestic editions are not available.	Petroleum, crude oil, unfinished oils, and finished products (see definitions at the end)
Brazil nuts, unroasted	Pine needle oil
Cadmium, ores and flue dust	Platinum and related group metals, refined as sponge, powder, ingots, or cast bars.
Calcium cyanamide	Pyrethrum flowers
Capers	Quartz crystals
Cashew nuts	Quebracho
Castor beans and castor oil	Quinidine
Chalk, English	Quinine
Chestnuts	Rabbit fur felt
Chicle	Radium salts, source and special nuclear materials
Chrome ore or chromite	Rosettes
Cinchona bark	Rubber, crude and latex
Cobalt, in cathodes, rondelles, or other primary ore and metal forms.	Rutile
Cocoa beans	Santonin, crude
Coconut and coconut meat, unsweetened, in shredded, desiccated or similarly prepared form.	Secretin
Coffee, raw or green bean	Shellac
Colchicine alkaloid, raw	Silk, raw and unmanufactured
Copra	Spare and replacement parts for equipment of foreign manufacture, and for which domestic parts are not available.
Cork, wood or bark and waste	Spices and herbs, in bulk
Cover glass, microscope slide	Sugars, raw
Cryolite, natural	Swords and scabbards
Dammar gum	Talc, block, steatite
Diamonds, industrial, stones and abrasives	Tantalum
Emetine, bulk	Tapioca flour and cassava
Ergot, crude	Tartar, crude; tartaric acid and cream of tartar in bulk.
Erthrityl tetranitrate	Tea in bulk
Fair linen, altar	Thread, metallic (gold)
Fibers of the following types: abaca, abace, agave, coir, flax, jute, jute burlaps, palmyra and sisal.	Thyme oil
Goat and kidskins	Tin in bars, blocks, and pigs
Graphite, natural, crystalline, crucible grade	Tripolidine hydrochloride
Handsewing needles	Tungsten
Hemp yarn	Vanilla beans
Hogbristles for brushes	Venom, cobra
Hyoscine, bulk	Wax, canauba
Ipecac, root	Woods; logs, veneer, and lumber of the following species: Alaskan yellow cedar, angelique, balsa, ekki greenhart, lignum vitae, mahogany, and teak.
Iodine, crude	Yarn, 50 Denier rayon
Kaurigum	
Lac	
Leather, sheepskin, hair type	
Lavender oil	

**List of Supplies/Materials that the U.S. Government Has Determined Are Not Produced In the United States In Sufficient and Reasonably Available Quantities And of Sufficient Quality (Jan 1991) (CONTINUED)**

Petroleum terms are used as follows:

“Crude oil” means crude petroleum, as it is produced at the wellhead, and liquids (under atmospheric conditions) that have been recovered from mixtures of hydrocarbons that existed in a vaporous phase in a reservoir and that are not natural gas products.

“Finished products” means any one or more of the following petroleum oils, or a mixture or combination of these oils, to be used without further processing except blending by mechanical means:

- (A) “Asphalt” - a solid or semi-solid cementitious material that (1) gradually liquefies when heated, (2) has bitumens as its predominating constituents, and (3) is obtained in refining crude oil.
- (B) “Fuel oil” - a liquid or liquefiable petroleum product burned for lighting or for the generation of heat or power and derived directly or indirectly from crude oil, such as kerosene, range oil, distillate fuel oils, gas oil, diesel fuel, topped crude oil, or residues.
- (C) “Gasoline” - a refined petroleum distillate that, by its consumption, is suitable for use as a carburant in internal combustion engines.
- (D) “Jet fuel” - a refined petroleum distillate used to fuel jet propulsion engines.
- (E) “Liquefied gases” - hydrocarbon gases recovered from natural gas or produced from petroleum refining and kept under pressure to maintain a liquid state at ambient temperatures.
- (F) “Lubricating oil” - a refined petroleum distillate or specially treated petroleum residue used to lessen friction between surfaces.
- (G) “Naphtha” - a refined petroleum distillate falling within a distillation range overlapping the higher gasoline and the lower kerosenes.
- (H) “Natural gas products” - liquids (under atmospheric conditions) including natural gasoline, that -
  - (1) are recovered by a process of absorption, adsorption, compression, refrigeration, cycling, or a combination of these processes, from mixtures of hydrocarbons that existed in a vaporous phase in a reservoir, and
  - (2) when recovered and without processing in a refinery, definitions of products contained in subdivision (B), (C), and (G) above.
- (I) “Residual fuel oil” - a topped crude oil or viscous residuum that, as obtained in refining or after blending with other fuel oil, meets or is the equivalent of MILSPEC Mil-F-859 for Navy Special Fuel Oil and any more viscous fuel oil, such as No. 5 or Bunker C.

“Unfinished oils” means one or more of the petroleum oils listed under “Finished products” above, or a mixture or combination of these oils, that are to be further processed other than by blending by mechanical means.

ALASKA INDUSTRIAL DEVELOPMENT EXPORT AUTHORITY

**SUBCONTRACTOR LIST**  
**Ketchikan Shipyard Medium Voltage Loop**  
**19014**

The apparent low bidder shall complete this form and submit it so as to be received by the Contracting Officer prior to the close of business on the fifth working day after receipt of written notice from the Authority.

Failure to submit this form with all required information by the due date will result in the bidder being declared nonresponsive and may result in the forfeiture of the Bid Security.

Scope of work must be clearly defined. If an item of work is to be performed by more than one firm, indicate the portion or percent of work to be done by each.

**Check as applicable:**       [ ] All Work on the above-referenced project will be accomplished without subcontracts greater than  $\frac{1}{2}$  of 1% of the contract amount.  
   or  
   [ ] Subcontractor List is as follows:

**LIST FIRST TIER SUBCONTRACTORS ONLY**

FIRM NAME, ADDRESS, PHONE NO.	AK BUSINESS LICENSE NO., CONTRACTOR'S REGISTRATION NO.	SCOPE OF WORK TO BE PERFORMED

CONTINUE SUBCONTRACTOR INFORMATION ON REVERSE

**For projects with federal-aid funding, I hereby certify Alaska Business Licenses and Contractor's Registrations will be valid for all subcontractors prior to award of the subcontract. For projects without federal-aid funding (State funding only), I hereby certify the listed Alaska Business Licenses and Contractor's Registrations were valid at the time bids were opened for this project.**

\_\_\_\_\_  
Signature of Authorized Company Representative

\_\_\_\_\_  
Title

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

\_\_\_\_\_  
Company Address (Street or PO Box, City, State, Zip)

\_\_\_\_\_  
Date

( )  
\_\_\_\_\_  
Phone Number



**CONSTRUCTION CONTRACT**

**Ketchikan Shipyard Medium Voltage Loop  
19014**

This CONTRACT, between the ALASKA INDUSTRIAL DEVELOPMENT EXPORT AUTHORITY, herein called the Authority, acting by and through its Contracting Officer, and

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

\_\_\_\_\_  
**Company Address (Street or PO Box, City, State, Zip)**

a/an  Individual  Partnership  Joint Venture  Sole Proprietorship  Corporation incorporated under the laws of the State of \_\_\_\_\_, its successors and assigns, herein called the Contractor, is effective the date of the signature of the Contracting Officer on this document.

WITNESSETH: That the Contractor, for and in consideration of the payment or payments herein specified and agreed to by the Department, hereby covenants and agrees to furnish and deliver all the materials and to do and perform all the work and labor required in the construction of the above-referenced project at the prices bid by the Contractor for the respective estimated quantities aggregating approximately the sum of

\_\_\_\_\_ Dollars  
(\$ \_\_\_\_\_), and such other items as are mentioned in the original Bid, which Bid and prices named, together with the Contract Documents are made a part of this Contract and accepted as such.

It is distinctly understood and agreed that no claim for additional work or materials, done or furnished by the Contractor and not specifically herein provided for, will be allowed by the Authority, nor shall the Contractor do any work or furnish any material not covered by this Contract, unless such work is ordered in writing by the Authority. In no event shall the Authority be liable for any materials furnished or used, or for any work or labor done, unless the materials, work, or labor are required by the Contract or on written order furnished by the Authority. Any such work or materials which may be done or furnished by the Contractor without written order first being given shall be at the Contractor's own risk, cost, and expense and the Contractor hereby covenants and agrees to make no claim for compensation for work or materials done or furnished without such written order.

The Contractor further covenants and agrees that all materials shall be furnished and delivered and all labor shall be done and performed, in every respect, to the satisfaction of the Authority, on or before: \_\_\_\_\_ or within \_\_\_\_\_ calendar days. It is expressly understood and agreed that in case of the failure on the part of the Contractor, for any reason, except with the written consent of the Authority, to complete the furnishing and delivery of materials and the doing and performance of the work before the aforesaid date, the Authority shall have the right to deduct from any money due or which may become due the Contractor, or if no money shall be due, the Authority shall have the right to recover \_\_\_\_\_ Dollars (\$ \_\_\_\_\_) per day for each calendar day elapsing between the time stipulated for the completion and the actual date of completion in accordance with the terms hereof; such deduction to be made, or sum to be recovered, not as a penalty but as liquidated damages.

The bonds given by the Contractor in the sum of \$ \_\_\_\_\_ Payment Bond, and \$ \_\_\_\_\_ Performance Bond, to secure the proper compliance with the terms and provisions of this Contract, are submitted herewith and made a part hereof.

IN WITNESS WHEREOF, the parties hereto have executed this Contract and hereby agree to its terms and conditions.

---

**CONTRACTOR**

---

**Company Name**

---

**Signature of Authorized Company Representative**

---

**Typed Name and Title**

---

**Date**

(Corporate Seal)

---

**ALASKA INDUSTRIAL DEVELOPMENT EXPORT AUTHORITY**

---

**Signature of Contracting Officer**

---

**Typed Name**

---

**Date**

**PERFORMANCE BOND**

Bond No. \_\_\_\_\_

For

**Ketchikan Shipyard Medium Voltage Loop  
19014**

KNOW ALL WHO SHALL SEE THESE PRESENTS:

That \_\_\_\_\_  
of \_\_\_\_\_ as Principal,  
and \_\_\_\_\_  
of \_\_\_\_\_ as Surety,  
firmly bound and held unto the State of Alaska in the penal sum of \_\_\_\_\_ Dollars

(\$ \_\_\_\_\_) good and lawful money of the United States of America for the payment whereof, well and truly to be paid to the State of Alaska, we bind ourselves, our heirs, successors, executors, administrators, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the said Principal has entered into a written contract with said State of Alaska, on the \_\_\_\_\_ of \_\_\_\_\_ A.D., 20\_\_\_\_, for construction of the above-named project, said work to be done according to the terms of said contract.

Now, THEREFORE, the conditions of the foregoing obligation are such that if the said Principal shall well and truly perform and complete all obligations and work under said contract and if the Principal shall reimburse upon demand of the Alaska Energy Authority any sums paid him which exceed the final payment determined to be due upon completion of the project, then these presents shall become null and void; otherwise they shall remain in full force and effect.

IN WITNESS WHEREOF, we have hereunto set our hands and seals at \_\_\_\_\_, this \_\_\_\_\_ day of \_\_\_\_\_ A.D., 20\_\_\_\_.

**Principal:** \_\_\_\_\_

**Address:** \_\_\_\_\_

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

**Contact Name:** \_\_\_\_\_

**Phone:** ( ) \_\_\_\_\_

**Surety:** \_\_\_\_\_

**Address:** \_\_\_\_\_

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

**Contact Name:** \_\_\_\_\_

**Phone:** ( ) \_\_\_\_\_

The offered bond has been checked for adequacy under the applicable statutes and regulations:

\_\_\_\_\_  
Alaska Industrial Development Export Authority Authorized Representative

\_\_\_\_\_  
Date

See Instructions on Reverse

## INSTRUCTIONS

1. This form shall be used whenever a performance bond is required. There shall be no deviation from this form without approval from the Contracting Officer.
2. The full legal name, business address, phone number, and point of contact of the Principal and Surety shall be typed on the face of the form. Where more than a single surety is involved, a separate form shall be executed for each surety.
3. The penal amount of the bond, or in the case of more than one surety the amount of obligation, shall be typed in words and in figures.
4. Where individual sureties are involved, a completed Affidavit of Individual Surety shall accompany the bond. Such forms are available upon request from the Contracting Officer.
5. The bond shall be signed by authorized persons. Where such person is signing in a representative capacity (e.g., an attorney-in-fact), but is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved, evidence of authority must be furnished.



**PAYMENT BOND**

Bond No. \_\_\_\_\_

For

**Ketchikan Shipyard Medium Voltage Loop  
19014**

NOW ALL WHO SHALL SEE THESE PRESENTS:

That \_\_\_\_\_  
of \_\_\_\_\_ as Principal,  
and \_\_\_\_\_  
of \_\_\_\_\_ as Surety,  
firmly bound and held unto the State of Alaska in the penal sum of \_\_\_\_\_ Dollars

(\$ \_\_\_\_\_) good and lawful money of the United States of America for the payment whereof, well and truly to be paid to the State of Alaska, we bind ourselves, our heirs, successors, executors, administrators, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the said Principal has entered into a written contract with said State of Alaska, on the \_\_\_\_\_ of \_\_\_\_\_ A.D., 20\_\_\_\_, for construction of the above-referenced project, said work to be done according to the terms of said contract.

Now, THEREFORE, the conditions of the foregoing obligation are such that if the said Principal shall comply with all requirements of law and pay, as they become due, all just claims for labor performed and materials and supplies furnished upon or for the work under said contract, whether said labor be performed and said materials and supplies be furnished under the original contract, any subcontract, or any and all duly authorized modifications thereto, then these presents shall become null and void; otherwise they shall remain in full force and effect.

IN WITNESS WHEREOF, we have hereunto set our hands and seals at \_\_\_\_\_, this \_\_\_\_\_ day of \_\_\_\_\_ A.D., 20\_\_\_\_.

**Principal:** \_\_\_\_\_

**Address:** \_\_\_\_\_

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

**Contact Name:** \_\_\_\_\_

**Phone:** ( ) \_\_\_\_\_

**Surety:** \_\_\_\_\_

**Address:** \_\_\_\_\_

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

**Contact Name:** \_\_\_\_\_

**Phone:** ( ) \_\_\_\_\_

The offered bond has been checked for adequacy under the applicable statutes and regulations:

\_\_\_\_\_  
Alaska Industrial Development Export Authority Authorized Representative

\_\_\_\_\_  
Date

See Instructions on Reverse

## INSTRUCTIONS

1. This form, for the protection of persons supplying labor and material, shall be used whenever a payment bond is required. There shall be no deviation from this form without approval from the Contracting Officer.
2. The full legal name, business address, phone number, and point of contact of the Principal and Surety shall be typed on the face of the form. Where more than a single surety is involved, a separate form shall be executed for each surety.
3. The penal amount of the bond, or in the case of more than one surety the amount of obligation, shall be typed in words and in figures.
4. Where individual sureties are involved, a completed Affidavit of Individual Surety shall accompany the bond. Such forms are available upon request from the Contracting Officer.
5. The bond shall be signed by authorized persons. Where such persons are signing in a representative capacity (e.g., an attorney-in-fact), but is not a member of the firm, partnership, or joint venture, or an officer of the corporation involved, evidence of authority must be furnished.

# CONTRACTOR'S QUESTIONNAIRE

**Ketchikan Shipyard Medium Voltage Loop  
19014**

## A. FINANCIAL

1. Have you ever failed to complete a contract due to insufficient resources?  
[ ] No [ ] Yes If YES, explain:

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2. Describe any arrangements you have made to finance this work: \_\_\_\_\_

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## B. EQUIPMENT

1. Describe below the equipment you have available and intend to use for this project.

ITEM	QUAN.	MAKE	MODEL	SIZE/ CAPACITY	PRESENT MARKET VALUE

2. What percent of the total value of this contract do you intend to subcontract? \_\_\_\_\_ %

3. Do you propose to purchase any equipment for use on this project?  
 No  Yes If YES, describe type, quantity, and approximate cost:

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4. Do you propose to rent any equipment for this work?  
 No  Yes If YES, describe type and quantity:

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---

---

5. Is your bid based on firm offers for all materials necessary for this project?  
 Yes  No If NO, please explain:

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**C. EXPERIENCE**

1. Have you had previous construction contracts or subcontracts with the Authority?  
 Yes  No

Describe the most recent or current contract, its completion date, and scope of work:

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2. List, as an attachment to this questionnaire, other construction projects you have completed, the dates of completion, scope of work, and total contract amount for each project completed in the past 12 months.

**I hereby certify that the above statements are true and complete.**

\_\_\_\_\_  
Name of Contractor

\_\_\_\_\_  
Name and Title of Person Signing

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

**ALASKA INDUSTRIAL DEVELOPMENT EXPORT AUTHORITY  
DOCUMENT 00700**

**GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT FOR BUILDINGS**

**ARTICLE 1 - DEFINITIONS**

**ARTICLE 2 - AUTHORITIES AND LIMITATIONS**

- 2.1 Authorities and Limitations
- 2.2 Evaluations by Contracting Officer
- 2.3 Means and Methods
- 2.4 Visits to Site

**ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE**

- 3.1 Incomplete Contract Documents
- 3.2 Copies of Contract Documents
- 3.3 Scope of Work
- 3.4 Intent of Contract Documents
- 3.5 Discrepancy in Contract Documents
- 3.6 Clarifications and Interpretations
- 3.7 Reuse of Documents

**ARTICLE 4 - LANDS AND PHYSICAL CONDITIONS**

- 4.1 Availability of Lands
- 4.2 Visit to Site/Place of Business
- 4.3 Explorations and Reports
- 4.4 Utilities
- 4.5 Damaged Utilities
- 4.6 Utilities Not Shown or Indicated
- 4.7 Survey Control

**ARTICLE 5 - BONDS AND INSURANCE**

- 5.1 Delivery of Bonds
- 5.2 Bonds
- 5.3 Replacement of Bond and Surety
- 5.4 Insurance Requirements
- 5.5 Indemnification

**ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES**

- 6.1 Supervision of Work
- 6.2 Superintendence by CONTRACTOR
- 6.3 Character of Workers
- 6.4 CONTRACTOR to Furnish
- 6.5 Materials and Equipment
- 6.6 Anticipated Schedules
- 6.7 Finalizing Schedules
- 6.8 Adjusting Schedules
- 6.9 Substitutes or "Or-Equal" Items
- 6.10 Substitute Means and Methods
- 6.11 Evaluation of Substitution
- 6.12 Dividing the Work
- 6.13 Subcontractors
- 6.14 Use of Premises
- 6.15 Structural Loading
- 6.16 Record Documents
- 6.17 Safety and Protection
- 6.18 Safety Representative
- 6.19 Emergencies
- 6.20 Shop Drawings and Samples
- 6.21 Shop Drawing and Sample Review
- 6.22 Maintenance during Construction

- 6.23 Continuing the Work
- 6.24 Consent to Assignment
- 6.25 Use of Explosives
- 6.26 CONTRACTOR's Records
- 6.27 Load Restrictions

**ARTICLE 7 - LAWS AND REGULATIONS**

- 7.1 Laws to be observed
- 7.2 Permits, Licenses, and Taxes
- 7.3 Patented Devices, Materials and Processes
- 7.4 Compliance of Specifications and Drawings
- 7.5 Accident Prevention
- 7.6 Sanitary Provisions
- 7.7 Business Registration
- 7.8 Professional Registration and Certification
- 7.9 Local Building Codes
- 7.10 Air Quality Control
- 7.11 Archaeological or Paleontological Discoveries
- 7.12 Applicable Alaska Preferences
- 7.13 Wages and Hours of Labor
- 7.14 Overtime Work Hours and Compensation

**ARTICLE 8 - OTHER WORK**

- 8.1 Related Work at Site
- 8.2 Access, Cutting, and Patching
- 8.3 Defective Work by Others
- 8.4 Coordination

**ARTICLE 9 - CHANGES**

- 9.1 Authority's Right to Change
- 9.2 Authorization of Changes within the General Scope
- 9.3 Directive
- 9.4 Change Order
- 9.5 Shop Drawing Variations
- 9.6 Changes outside the General Scope; Supplemental Agreement
- 9.7 Unauthorized Work
- 9.8 Notification of Surety
- 9.9 Differing Site Conditions
- 9.10 Interim Work Authorization

**ARTICLE 10- CONTRACT PRICE; COMPUTATION AND CHANGE**

- 10.1 Contract Price
- 10.2 Claim for Price Change
- 10.3 Change Order Price Determination
- 10.4 Cost of the Work
- 10.5 Excluded Costs
- 10.6 CONTRACTOR's Fee
- 10.7 Cost Breakdown
- 10.8 Cash Allowances
- 10.9 Unit Price Work
- 10.10 Determinations for Unit Prices

<b>ARTICLE</b>	<b>11-</b>	<b>CONTRACT TIME, COMPUTATION AND CHANGE</b>
	11.1	Commencement of Contract Time; Notice to Proceed
	11.2	Starting the Work
	11.3	Computation of Contract Time
	11.4	Time Change
	11.5	Extension Due to Delays
	11.6	Essence of Contract
	11.7	Reasonable Completion Time
	11.8	Delay Damages
<b>ARTICLE</b>	<b>12 -</b>	<b>QUALITY ASSURANCE</b>
	12.1	Warranty and Guaranty
	12.2	Access to Work
	12.3	Tests and Inspections
	12.4	Uncovering Work
	12.5	Authority May Stop the Work
	12.6	Correction or Removal of Defective Work
	12.7	One Year Correction Period
	12.8	Acceptance of Defective Work
	12.9	Authority may Correct Defective Work
<b>ARTICLE</b>	<b>13-</b>	<b>PAYMENTS TO CONTRACTOR AND COMPLETION</b>
	13.1	Schedule of Values
	13.2	Preliminary Payments
	13.3	Application for Progress Payment
	13.4	Review of Applications for Progress Payments
	13.5	Stored Materials and Equipment
	13.6	CONTRACTOR's Warranty of Title
	13.7	Withholding of Payments
	13.8	Retainage
	13.9	Request for Release of funds
	13.10	Substantial Completion
	13.11	Access Following Substantial Completion
	13.12	Final Inspection
	13.13	Final Completion and Application for Payment
	13.14	Final Payment
	13.15	Final Acceptance
	13.16	CONTRACTOR's Continuing Obligation
	13.17	Waiver of Claims by CONTRACTOR
	13.18	No Waiver of Legal Rights
<b>ARTICLE</b>	<b>14-</b>	<b>SUSPENSION OF WORK AND TERMINATION</b>
	14.1	DEPARTMENT May Suspend Work
	14.2	Default of Contract
	14.3	Rights or Remedies
	14.4	Convenience Termination
<b>ARTICLE</b>	<b>15-</b>	<b>CLAIMS AND DISPUTES</b>
	15.1	Notification
	15.2	Presenting the Claim
	15.3	Claim Validity, Additional Information & DEPARTMENT's Action
	15.4	Contracting Officer's Decision
	15.5	Fraud and Misrepresentation in Making Claims

## ACKNOWLEDGMENT

"Alaska Industrial Development and Export Authority's, General Conditions of the Construction Contract for Buildings" is based on the "Standard General Conditions of the Construction Contract" as published by the National Society of Professional Engineers (document number 1910-8, 1983 edition) on behalf of the Engineers Joint Construction Documents Committee. Portions of the NSPE General Conditions are reprinted herein by the express permission of NSPE. Modifications to the NSPE text are made to provide for State laws, regulations, and established procedures.

The granting of permission by NSPE to allow the State of Alaska (AIDEA) to preprint portions of the NSPE document 1910-8, 1983 edition does not constitute approval of the State of Alaska (AIDEA) General Conditions of the Construction Contract for Buildings.

### ARTICLE 1 - DEFINITIONS

Wherever used in the Contract Documents the following terms, or pronouns in place of them, are used, the intent and meaning, unless a different intent or meaning is clearly indicated, shall be interpreted as set forth below.

The titles and headings of the articles, sections, and subsections herein are intended for convenience of reference."

Terms not defined below shall have their ordinary accepted meanings within the context which they are used. Words which have a well-known technical or trade meaning when used to describe work, materials or equipment shall be interpreted in accordance with such meaning. Words defined in Article 1 are to be interpreted as defined.

**Addenda** - All clarifications, corrections, or changes issued graphically or in writing by the AUTHORITY after the Advertisement but prior to the opening of Proposals.

**Advertisement** - The public announcement, as required by law, inviting bids for Work to be performed or materials to be furnished.

**Alaska Industrial Development and Export Authority** - The Mission of the Alaska Industrial Development and Export Authority is to promote, develop and advance economic growth and diversification in Alaska by providing various means of financing and investment. Where used in the contract documents, the State, Department, AIDEA, the Authority shall mean Alaska Industrial Development and Export Authority.

**Application for Payment** - The form provided by the AUTHORITY which is to be used by the CONTRACTOR in requesting progress or final payments and which is to include such supporting documentation as is required by the Contract Documents.

**Approved or Approval** - 'Approved' or 'Approval' as used in this contract document shall mean that the AUTHORITY has received a document, form or submittal from the contractor and that the AUTHORITY has taken "No exceptions" to the item submitted. Unless the context clearly indicates otherwise, approved or approval shall not mean that the AUTHORITY approves of the methods or means, or that the item or form submitted meets the requirements of the contract or constitutes acceptance of the Contractor's work. Where approved or approval means acceptance, then such approval must be set forth in writing and signed by the contracting officer or his designee.

**Architect** - Where used in the contract documents, "ARCHITECT" shall mean the AUTHORITY'S ENGINEER.

**Architect/Engineer** - Where used in the contract documents, "ARCHITECT/ENGINEER" shall mean the AUTHORITY'S ENGINEER.

**A.S** - Initials which stand for Alaska Statute.



**Award** - The acceptance, by the AUTHORITY, of the successful bid.

**Bid Bond** - A type of Proposal Guaranty.

**Bidder** - Any individual, firm, corporation or any acceptable combination thereof, or joint venture submitting a bid for the advertised Work.

**Calendar Day** - Every day shown on the calendar, beginning and ending at midnight.

**Change Order** - A written order by the AUTHORITY directing changes to the Contract Documents, within their general scope.

**Consultant** - The person, firm, or corporation retained directly by the AUTHORITY to prepare Contract Documents, perform construction administration services, or other Project related services.

**Contingent Sum Work Item** - When the bid schedule contains a Contingent Sum Work Item, the Work covered shall be performed only upon the written Directive of the Project Manager. Payment shall be made as provided in the Directive.

**Contract** - The written agreement between the AUTHORITY and the CONTRACTOR setting forth the obligations of the parties and covering the Work to be performed, all as required by the Contract Documents.

**Contract Documents** - The Contract form, Addenda, the bidding requirements and CONTRACTOR's bid (including all appropriate bid tender forms), the bonds, the Conditions of the Contract and all other Contract requirements, the Specifications, and the Drawings furnished by the AUTHORITY to the CONTRACTOR, together with all Change Orders and documents approved by the Contracting Officer, for inclusion, modifications and supplements issued on or after the Effective Date of the Contract.

**Contracting Officer** - The person authorized by the Commissioner to enter into and administer the Contract on behalf of the AUTHORITY. Who has authority to make findings, determinations and decisions with respect to the Contract and, when necessary, to modify or terminate the Contract. The Contracting Officer is identified on the construction Contract.

**CONTRACTOR** - The individual, firm, corporation or any acceptable combination thereof, contracting with the AUTHORITY for performance of the Work.

**Contract Price** - The total moneys payable by the AUTHORITY to the CONTRACTOR under the terms of the Contract Documents.

**Contract Time** - The number of Calendar Days following issuance of Notice-to-Proceed in which the project shall be rendered Substantially Complete, or if specified as a calendar date, the Substantial Completion date specified in the Contract Documents

**Controlling Item** - Any feature of the Work on the critical path of a network schedule.

**Defective** - Work that is unsatisfactory, faulty or deficient, or does not conform to the Contract Documents.

**DEPARTMENT** - The Alaska Industrial Development and Export Authority. References to "Owner", "State", "Contracting Agency", mean the AUTHORITY.

**Directive** - A written communication to the CONTRACTOR from the Contracting Officer interpreting or enforcing a Contract requirement or ordering commencement of an item of Work.

**Drawings** - The Drawings which show the character and scope of the Work to be performed and which have been furnished by the AUTHORITY or the AUTHORITY's Consultant and are by reference made a part of the Contract Documents.

**ENGINEER** - The AUTHORITY'S authorized representative of the Contracting Officer, as defined in the AUTHORITY'S *delegation of authority letter* to be issued after notice-to-proceed, who is responsible for

administration of the contract.

**Equipment** - All machinery together with the necessary supplies for upkeep and maintenance, and also tools and apparatus necessary for the proper construction and acceptable completion of the work.

**Final Acceptance** - The AUTHORITY's written acceptance of the Work following Final Completion and the performance of all Contract requirements by the CONTRACTOR.

**Final Completion** - The Project (or specified part thereof) has progressed to the point that all required Work is complete as determined by the Contracting Officer.

**Furnish** - To procure, transport, and deliver to the project site materials, labor, or equipment, for installation or use on the project.

**General Requirements** - Sections of Division I of the Specifications which contain administrative and procedural requirements as well as requirements for temporary facilities which apply to Specification Divisions 2 through I6.

**Holidays** - Legal Holidays occur on:

1. New Year's Day - January 1
2. Martin Luther King's Birthday - Third Monday in January
3. President's Day - Third Monday in February
4. Seward's Day - Last Monday in March
5. Memorial Day - Last Monday in May
6. Independence Day - July 4
7. Labor Day - First Monday in September
8. Alaska Day - October 18
9. Veteran's Day - November 11
10. Thanksgiving Day - Fourth Thursday in November
11. Christmas Day - December 25
12. Every Sunday
13. Every day designated by public proclamation by the President of the United States or the Governor of the State as a legal Holiday.

If any Holiday listed above falls on a Saturday, Saturday and the preceding Friday are both legal Holidays. If the Holiday should fall on a Sunday, except (12) above, Sunday and the following Monday are both legal Holidays. See Title 44, Alaska Statutes.

**Inspector** - The Engineer's authorized representative assigned to make detailed observations relating to contract performance.

**Install** - Means to build into the Work, ready to be used in complete and operable condition and in compliance with Contract Documents.

**Interim Work Authorization** - A written order by the Engineer initiating changes to the Contract, within its general scope, until a subsequent Change Order is executed.

**Invitation for Bids** - A portion of the bidding documents soliciting bids for the Work to be performed.

**Laboratory** - The official testing laboratories of the AUTHORITY or such other laboratories as may be designated by the Engineer or identified in the contract documents.

**Materials** - Any substances specified for use in the construction of the project.

**Notice of Intent to Award** - The written notice by the AUTHORITY to all Bidders identifying the apparent successful Bidder and establishing the AUTHORITY's intent to execute the Contract when all conditions required for execution of the Contract are met.

**Notice to Proceed** - A written notice to the CONTRACTOR to begin the Work and establishing the date on which the Contract Time begins.

**Payment Bond** - The security furnished by the CONTRACTOR and his Surety to guarantee payment of the debts covered by the bond.

**Performance Bond** - The security furnished by the CONTRACTOR and his Surety to guarantee performance and completion of the Work in accordance with the Contract.

**Preconstruction Conference** - A meeting between the CONTRACTOR and the Engineer, and other parties affected by the construction, to discuss the project before the CONTRACTOR begins work.

**Project** - The total construction, of which the Work performed under the Contract Documents is the whole or a part, where such total construction may be performed by more than one CONTRACTOR.

**Project Manager** - The authorized representative of the Contracting Officer who is responsible for administration of the Contract.

**Proposal** - The offer of a Bidder, on the prescribed forms, to perform the Work at the prices quoted.

**Proposal Guaranty** - The security furnished with a Proposal to guarantee that the bidder will enter into a Contract if their Proposal is accepted by the AUTHORITY.

**Quality Assurance (QA)** - Where referred to in the technical specifications (Divisions 2 through 16), Quality Assurance refers to measures to be provided by the CONTRACTOR as specified.

**Quality Control (QC)** - Tests and inspections by the CONTRACTOR to insure the acceptability of materials incorporated into the work. QC test reports are used as a basis upon which to determine whether the Work conforms to the requirements of the Contract Documents and to determine its acceptability for payment.

**Regulatory Requirements** - Laws, rules, regulations, ordinances, codes and/or orders.

**Schedule of Values** - The AUTHORITY's document, submitted by the CONTRACTOR and reviewed by the Contracting Officer, which shall serve as the basis for computing payment and for establishing the value of separate items of Work which comprise the Contract Price.

**Shop Drawings** - All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for the CONTRACTOR to illustrate some portion of the Work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a Supplier and submitted by the CONTRACTOR to illustrate material, equipment, fabrication, or erection for some portion of the Work. Where used in the Contract Documents, "Shop Drawings" shall also mean "Submittals".

**Specifications** - Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative and procedural details applicable thereto.

**Subcontractor** - An individual, firm, or corporation to whom the CONTRACTOR or any other Subcontractor sublets part of the Contract.

**Substantial Completion** - Although not fully completed, the Work (or a specified part thereof) has progressed to the point where, in the opinion of the Contracting Officer, as evidence by the AUTHORITY's written notice, it is sufficiently complete, in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended. The terms "Substantially Complete" and "Substantially Completed" as applied to any Work refer to Substantial Completion thereof.

**Supplemental Agreement** - A written agreement between the CONTRACTOR and the AUTHORITY

covering work that is not within the general scope of the Contract.

**Supplementary Conditions** - The part of the Contract Documents which amends or supplements these General Conditions.

**Supplier** - A manufacturer, fabricator, distributor, materialman or vendor of materials or equipment.

**Surety** - The corporation, partnership, or individual, other than the CONTRACTOR, executing a bond furnished by the CONTRACTOR.

**Traffic Control Plan (TCP)** - A drawing of one or more specific plans that detail the routing of pedestrian, and/or vehicular traffic through or around a construction area.

**Unit Price Work** - Work to be paid for on the basis of unit prices.

**Using Agency** - The entity who will occupy or use the completed Project.

**Utility** - The privately, publicly or cooperatively owned lines, facilities and systems for producing, transmitting or distributing communications, power, electricity, light, heat, gas, oil, crude products, water, steam, waste, storm water not connected with highway or street drainage, and other similar commodities, including publicly owned fire and police signal systems, street lighting systems, and railroads which directly or indirectly serve the public or any part thereof. The term "utility" shall also mean the utility company, inclusive of any wholly owned or controlled subsidiary."

**Work** - Work is the act of, and the result of, performing services, furnishing labor, furnishing and incorporating materials and equipment into the Project and performing other duties and obligations, all as required by the Contract Documents. Such Work, however incremental, will culminate in the entire completed Project, or the various separately identifiable parts thereof.

## **ARTICLE 2 - AUTHORIZATION AND LIMITATIONS**

### **2.1 Authorities and Limitations**

- 2.1.1 The Contracting Officer alone, shall have the power to bind the AUTHORITY and to exercise the rights, responsibilities, authorities and functions vested in the Contracting Officer by the Contract Documents. The Contracting Officer shall have the right to designate in writing authorized representatives to act for them. Wherever any provision of the Contract Documents specifies an individual or organization, whether governmental or private, to perform any act on behalf of or in the interest of the AUTHORITY that individual or organization shall be deemed to be the Contracting Officer's authorized representative under this Contract but only to the extent so specified.
- 2.1.2 The CONTRACTOR shall perform the Work in accordance with any written order (including but not limited to instruction, direction, interpretation or determination) issued by an authorized representative in accordance with the authorized representative's authority to act for the Contracting Officer. The CONTRACTOR assumes all the risk and consequences of performing the Work in accordance with any order (including but not limited to instruction, direction, interpretation or determination) of anyone not authorized to issue such order, and of any order not in writing.
- 2.1.3 Should the Contracting Officer or their authorized representative designate Consultant(s) to act for the AUTHORITY as provided for in Paragraph 2.1.1, the performance or nonperformance of the Consultant under such authority to act, shall not give rise to any contractual obligation or duty of the Consultant to the CONTRACTOR, any Subcontractor, any Supplier, or any other organization performing any of the Work or any Surety representing them.

## **2.2 Evaluations by Contracting Officer:**

2.2.1 The Contracting Officer will decide all questions which may arise as to:

- a. Quality and acceptability of materials furnished;
- b. Quality and acceptability of Work performed;
- c. Compliance with the schedule of progress;
- d. Interpretation of Contract Documents;
- e. Acceptable fulfillment of the Contract on the part of the CONTRACTOR.

2.2.2 In order to avoid cumbersome terms and confusing repetition of expressions in the Contract Documents the terms "as ordered", "as directed", "as required", "as approved" or terms of like effect or import are used, or the adjectives "reasonable", "suitable", "acceptable", "proper" or "satisfactory" or adjectives of like effect or import are used it shall be understood as if the expression were followed by the words "the Contracting Officer".

When such terms are used to describe a requirement, direction, review or judgment of the Contracting Officer as to the Work, it is intended that such requirement, direction, review or judgment will be solely to evaluate the Work for compliance with the Contract Documents (unless there is a specific statement indicating otherwise).

2.2.3 The use of any such term or adjective shall not be effective to assign to the AUTHORITY any duty of authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraphs 2.3 or 2.4.

## **2.3 Means & Methods:**

The means, methods, techniques, sequences or procedures of construction, or safety precautions and the program incident thereto, and the failure to perform or furnish the Work in accordance with the Contract Documents are the sole responsibility of the CONTRACTOR.

## **2.4 Visits to Site/Place of Business:**

The Contracting Officer will make visits to the site and approved remote storage sites at intervals appropriate to the various stages of construction to observe the progress and quality of the executed Work and to determine, in general, if the Work is proceeding in accordance with the Contract Documents. The Contracting Officer may, at reasonable times, inspect that part of the plant or place of business of the CONTRACTOR or Subcontractor that is related to the performance of the Contract.

Such observations or the lack of such observations shall in no way relieve the CONTRACTOR from their duty to perform the Work in accordance with the Contract Documents.

## **ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE**

### **3.1 Incomplete Contract Documents:**

The submission of a bid by the Bidder is considered a representation that the Bidder examined the Contract Documents to make certain that all sheets and pages were provided and that the Bidder is satisfied as to the conditions to be encountered in performing the Work. The AUTHORITY expressly denies any responsibility or liability for a bid submitted on the basis of an incomplete set of Contract Documents.

### **3.2 Copies of Contract Documents:**

The AUTHORITY shall furnish to the CONTRACTOR up to ten copies of the Contract Documents.

Additional copies will be furnished, upon request, at the cost of reproduction.

### **3.3 Scope of Work:**

The Contract Documents comprise the entire Contract between the AUTHORITY and the CONTRACTOR concerning the Work. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the Regulatory Requirements of the place of the Project.

It is specifically agreed between the parties executing this Contract that it is not intended by any of the provisions of the Contract to create in the public or any member thereof a third party benefit, or to authorize anyone not a party to this Contract to maintain a suit pursuant to the terms or provisions of the Contract.

### **3.4 Intent of Contract Documents:**

- 3.4.1 It is the intent of the Contract Documents to describe a functionally complete Project to be constructed in accordance with the Contract Documents. Any Work, materials or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result will be supplied, without any adjustment in Contract Price or Contract Time, whether or not specifically called for.
- 3.4.2 Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the Regulatory Requirements of any governmental authority, whether such reference be specific or by implication, shall mean the edition stated in the Contract Documents or if not stated the latest standard specification, manual, code or Regulatory Requirements in effect at the time of Advertisement for the Project (or, on the Effective Date of the Contract if there was no Advertisement). However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of the AUTHORITY and the CONTRACTOR, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to the AUTHORITY or any of the AUTHORITY's Consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraphs 2.3 or 2.4.

### **3.5 Discrepancy in Contract Documents:**

- 3.5.1 Before undertaking the Work, the CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures, and dimensions shown thereon and all applicable field measurements. Work in the area by the CONTRACTOR shall imply verification of figures, dimensions and field measurements. If, during the above study or during the performance of the Work, the CONTRACTOR finds a conflict, error, discrepancy or omission in the Contract Documents, or a discrepancy between the Contract Documents and any standard specification, manual, code, or Regulatory Requirement which affects the Work, the CONTRACTOR shall promptly report such discrepancy in writing to the Contracting Officer. The CONTRACTOR shall obtain a written interpretation or clarification from the Contracting Officer before proceeding with any Work affected thereby. Any adjustment made by the CONTRACTOR without this determination shall be at their own risk and expense. However, the CONTRACTOR shall not be liable to the AUTHORITY for failure to report any conflict, error or discrepancy in the Contract Documents unless the CONTRACTOR had actual knowledge thereof or should reasonably have known thereof.

### 3.5.2 Discrepancy - Order of Precedence:

When conflicts errors, or discrepancies within the Contract Documents exist, the order of precedence from most governing to least governing will be as follows:

- Contents of Addenda
- Supplementary Conditions
- General Conditions
- General Requirements
- Technical Specifications
- Drawings
- Recorded dimensions will govern over scaled dimensions
- Large scale details over small scale details
- Schedules over plans
- Architectural drawings over structural drawings Structural drawings over mechanical and electrical drawings

### 3.6 Clarifications and Interpretations:

The Contracting Officer will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents as the Contracting Officer may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents.

### 3.7 Reuse of Documents:

Neither the CONTRACTOR nor any Subcontractor, or Supplier or other person or organization performing or furnishing any of the Work under a direct or indirect contract with the AUTHORITY shall have or acquire any title to or ownership rights in any of the Contract Documents (or copies thereof) prepared by or for the AUTHORITY and they shall not reuse any of the Contract Documents on extensions of the Project or any other project without written consent of the Contracting Officer.

Contract Documents prepared by the CONTRACTOR in connection with the Work shall become the property of the AUTHORITY.

## ARTICLE 4 - LANDS AND PHYSICAL CONDITIONS

### 4.1 Availability of Lands:

The AUTHORITY shall furnish as indicated in the Contract Documents, the lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and such other lands which are designated for use of the CONTRACTOR in connection with the Work. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by the AUTHORITY, unless otherwise provided in the Contract Documents. The CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment. The CONTRACTOR shall provide all waste and disposal areas, including disposal areas for hazardous or contaminated materials, at no additional cost to the AUTHORITY.

### 4.2 Visit to Site:

The submission of a bid by the CONTRACTOR is considered a representation that the CONTRACTOR has visited and carefully examined the site and is satisfied as to the conditions to be encountered in performing the Work and as to the requirements of the Contract Documents.

### **4.3 Explorations and Reports:**

Reference is made to the Supplementary Conditions for identification of those reports of explorations and tests of subsurface conditions at the site that have been utilized by the AUTHORITY in preparation of the Contract Documents. The CONTRACTOR may for their purposes rely upon the accuracy of the factual data contained in such reports, but not upon interpretations or opinions drawn from such factual data contained therein or for the completeness or sufficiency thereof. Except as indicated in the immediately preceding sentence and in paragraphs 4.4 and 9.9, CONTRACTOR shall have full responsibility with respect to surface and subsurface conditions at the site.

### **4.4 Utilities:**

The horizontal and vertical locations of known underground utilities as shown or indicated by the Contract Documents are approximate and are based on information and data furnished to the AUTHORITY by the owners of such underground utilities.

4.4.2 The CONTRACTOR shall have full responsibility for:

- a. Reviewing and checking all information and data concerning utilities.
- b. Locating all underground utilities shown or indicated in the Contract Documents which are affected by the Work.
- c. Coordination of the Work with the owners of all utilities during construction.
- d. Safety and protection of all utilities as provided in paragraph 6.17.
- e. Repair of any damage to utilities resulting from the Work in accordance with 4.4.4 and 4.5.

4.4.3 If Work is to be performed by any utility owner, the CONTRACTOR shall cooperate with such owners to facilitate the Work.

4.4.4 In the event of interruption to any utility service as a result of accidental breakage or as result of being exposed or unsupported, the CONTRACTOR shall promptly notify the utility owner and the Contracting Officer. If service is interrupted, repair work shall be continuous until the service is restored. No Work shall be undertaken around fire hydrants until provisions for continued service has been approved by the local fire authority.

### **4.5 Damaged Utilities:**

When utilities are damaged by the CONTRACTOR, the utility owner shall have the choice of repairing the utility or having the CONTRACTOR repair the utility. In the following circumstances, the CONTRACTOR shall reimburse the utility owner for repair costs or provide at no cost to the utility owner or the AUTHORITY, all materials, equipment and labor necessary to complete repair of the damage:

- a. When the utility is shown or indicated in the Contract Documents.
- b. When the utility has been located by the utility owner.
- c. When no locate was requested by the CONTRACTOR for utilities shown or indicated in the Contract Documents.
- d. All visible utilities.
- e. When the CONTRACTOR could have, otherwise, reasonably been expected to be aware of such utility.



#### **4.6 Utilities Not Shown or Indicated:**

If, while directly performing the Work, an underground utility is uncovered or revealed at the site which was not shown or indicated in the Contract Documents and which the CONTRACTOR could not reasonably have been expected to be aware of, the CONTRACTOR shall, promptly after becoming aware thereof and before performing any Work affected thereby (except in an emergency as permitted by paragraph 6.19) identify the owner of such underground utility and give written notice thereof to that owner and to the Contracting Officer. The Contracting Officer will promptly review the underground utility to determine the extent to which the Contract Documents and the Work should be modified to reflect the impacts of the discovered utility. The Contract Documents will be amended or supplemented in accordance with paragraph 9.2 and to the extent necessary through the issuance of a change document by the Contracting Officer. During such time, the CONTRACTOR shall be responsible for the safety and protection of such underground utility as provided in paragraph 6.17. The CONTRACTOR may be allowed an increase in the Contract Price or an extension of the Contract Time, or both, to the extent that they are directly attributable to the existence of any underground utility that was not shown or indicated in the Contract Documents and which the CONTRACTOR could not reasonably have been expected to be aware of.

#### **4.7 Survey Control:**

The AUTHORITY will identify sufficient horizontal and vertical control data to enable the CONTRACTOR to survey and layout the Work. All survey work shall be performed under the direct supervision of a registered land surveyor when required by paragraph 7.8. Copies of all survey notes shall be provided to the AUTHORITY at an interval determined by the Project Manager. The Project Manager may request submission on a weekly or longer period at their discretion. Any variations between the Contract Documents and actual field conditions shall be identified in the survey notes.

### **ARTICLE 5 - BONDS, INSURANCE, AND INDEMNIFICATION**

#### **5.1 Delivery of Bonds:**

When the CONTRACTOR delivers the executed Contract to the Contracting Officer, the CONTRACTOR shall also deliver to the Contracting Officer such bonds as the CONTRACTOR may be required to furnish in accordance with paragraph 5.2.

#### **5.2 Bonds:**

The CONTRACTOR shall furnish Performance and Payment Bonds, each in an amount as shown on the Contract as security for the faithful performance and payment of all CONTRACTOR's obligations under the Contract Documents. These bonds shall remain in effect for one year after the date of Final Acceptance and until all obligations under this Contract, except special guarantees as per 12.7, have been met. All bonds shall be furnished on forms provided by the AUTHORITY (or copies thereof) and shall be executed by such Sureties as are authorized to do business in the State of Alaska. The Contracting Officer may at their option copy the Surety with notice of any potential default or liability.

#### **5.3 Replacement of Bond and Surety:**

If the Surety on any bond furnished in connection with this Contract is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of paragraph 5.2, or otherwise becomes unacceptable to the AUTHORITY, or if any such Surety fails to furnish reports as to their financial condition as requested by the AUTHORITY, the CONTRACTOR shall within five days thereafter substitute another bond and Surety, both of which must be acceptable to DEPARTMENT.

An individual Surety may be replaced by a corporate Surety during the course of the Contract period. If the Surety desires to dispose of the collateral posted, the AUTHORITY may, at its option, accept substitute collateral.

## 5.4 Insurance Requirements:

- 5.4.1 The CONTRACTOR shall provide evidence of insurance with a carrier or carriers satisfactory to the AUTHORITY covering injury to persons and/or property suffered by the Authority, State of Alaska or a third party, as a result of operations which arise both out of and during the course of this Contract by the CONTRACTOR or by any Subcontractor. This coverage will also provide protection against injuries to all employees of the CONTRACTOR and the employees of any Subcontractor engaged in Work under this Contract. The delivery to the AUTHORITY of a written 30 day notice is required before cancellation of any coverage or reduction in any limits of liability. Insurance carriers shall have an acceptable financial rating.
- 5.4.2 The CONTRACTOR shall maintain in force at all times during the performance of the work under this agreement the following policies and minimum limits of liability. Failure to maintain insurance may, at the option of the Contracting Officer, be deemed Defective Work and remedied in accordance with the Contract. Where specific limits and coverages are shown, it is understood that they shall be the minimum acceptable. The requirements of this paragraph shall not limit the CONTRACTOR's responsibility to indemnify under paragraph 5.5. Additional insurance requirements specific to this Contract are contained in the Supplementary Conditions, when applicable.
- a. Workers' Compensation Insurance: The Contractor shall provide and maintain, for all employees of the Contractor engaged in work under this contract, Workers' Compensation Insurance as required by AS 23.30.045. The Contractor shall be responsible for Workers' Compensation Insurance for any subcontractor who provides services under this contract, to include:
1. Waiver of subrogation against the Authority, State and Employer's Liability Protection in the amount of \$500,000 each accident/\$500,000 each disease.
  2. If the Contractor directly utilizes labor outside of the Authority and State of Alaska in the prosecution of the work, "Other States" endorsement shall be required as a condition of the contract.
  3. Whenever the work involves activity on or about navigable waters, the Workers' Compensation policy shall contain a United States Longshoreman's and Harbor Worker's Act endorsement, and when appropriate, a Maritime Employer's Liability (Jones Act) endorsement with a minimum limit of \$1,000,000.
- b. Comprehensive or Commercial General Liability Insurance: Such insurance shall cover all operations by or on behalf of the CONTRACTOR and provide insurance for bodily injury and property damage liability including coverage for: premises and operations; products and completed operations; contractual liability insuring obligations assumed under paragraph 5.5, Indemnification; broad form property damage; and personal injury liability.

The minimum limits of liability shall be:

1. If the CONTRACTOR carries a *Comprehensive General Liability* policy, the limits of liability shall not be less than a Combined Single Limit for bodily injury, property damage and Personal Injury Liability of:  
\$1,000,000 each occurrence  
\$2, 000,000 aggregate
2. If the CONTRATOR carries a *Commercial General Liability* policy, the limits of liability shall not be less than:  
\$1,000,000 each occurrence (Combined Single Limit for bodily injury and property damage)  
\$1,000,000 for Personal Injury Liability

\$2,000,000 aggregate for Products-Completed Operations  
\$2,000,000 general aggregate

The Alaska Industrial Development and Export Authority shall be named as an "Additional Insured" under all liability coverages listed above.

c. Automobile Liability Insurance:

Such insurance shall cover all owned, hired and non-owned vehicles and provide coverage not less than that of the Business Automobile Policy in limits not less than the following:

\$1,000,000 each occurrence  
(Combined Single Limit for bodily injury and property damage.)

d. Builder's Risk Insurance:

Coverage shall be on an "All Risk" completed value basis including "quake and flood" and protect the interests of the AUTHORITY, the CONTRACTOR and their Subcontractors. Coverage shall include all materials, supplies and equipment that are intended for specific installation in the Project while such materials, supplies and equipment are located at the Project site, in transit from port of arrival to job site and while temporarily located away from the Project site.

In addition to providing the above coverages the CONTRACTOR shall ensure that Subcontractors provide insurance coverages as noted in clauses a., b., and c. of this subparagraph. Builders Risk Insurance will only be required of subcontractors if so stated in the Supplementary Conditions.

e. Other Coverages:

As specified in the Supplementary Conditions.

- 5.4.3 In addition to providing the above coverages the Contractor shall, in any contract or agreement with subcontractors performing work, require that all indemnities and waivers of subrogation it obtains, and that any stipulation to be named as an additional insured it obtains, also be extended to waive rights of subrogation against the State of Alaska and to add the State of Alaska as additional named indemnitee and as additional insured.

Evidence of insurance shall be furnished to the AUTHORITY prior to the award of the contract. Such evidence, executed by the carrier's representative and issued to the AUTHORITY, shall consist of a certificate of insurance or the policy declaration page with required endorsements attached thereto which denote the type, amount, class of operations covered, effective (and retroactive) dates, and dates of expiration. Acceptance by the AUTHORITY of deficient evidence does not constitute a waiver of contract requirements.

When a certificate of insurance is furnished, it shall contain the following statement:  
"This is to certify that the policies described herein comply with all aspects of the insurance requirements of (Project Name and Number)

## 5.5 Indemnification:

The CONTRACTOR shall indemnify, save harmless, and defend the AUTHORITY, its agents and its employees from any and all claims, actions, or liabilities for injuries or damages sustained by any person or property arising directly or indirectly from the construction or the CONTRACTOR's performance of this Contract; however, this provision has no effect if, but only if, the sole proximate cause of the injury or damage is the AUTHORITY's negligence.

## **ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES**

### **6.1 Supervision of Work:**

The CONTRACTOR shall supervise and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. All Work under this Contract shall be performed in a skillful and workmanlike manner. The CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences and procedures of construction.

### **6.2 Superintendence by CONTRACTOR:**

The CONTRACTOR shall keep on the Work at all times during its progress a competent resident superintendent. The Contracting Officer shall be advised in writing of the superintendent's name, local address, and telephone number. This written advice is to be kept current until Final Acceptance by the AUTHORITY. The superintendent will be the CONTRACTOR's representative at the site and shall have full authority to act and sign documents on behalf of the CONTRACTOR.

All communications given to the superintendent shall be as binding as if given to the CONTRACTOR. The CONTRACTOR shall cooperate with the Contracting Officer in every way possible.

### **6.3 Character of Workers:**

The CONTRACTOR shall provide a sufficient number of competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. The CONTRACTOR shall at all times maintain good discipline and order at the site. The Contracting Officer may, in writing, require the CONTRACTOR to remove from the Work any employee the Contracting Officer deems incompetent, careless, or otherwise detrimental to the progress of the Work, but the Contracting Officer shall have no duty to exercise this right.

### **6.4 CONTRACTOR to Furnish:**

Unless otherwise specified in the General Requirements, the CONTRACTOR shall furnish and assume full responsibility for all materials, equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance testing, start-up and completion of the Work.

### **6.5 Materials and Equipment:**

All materials and equipment shall be of specified quality and new, except as otherwise provided in the Contract Documents. If required by the Contracting Officer, the CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with the instructions of the applicable Supplier except as otherwise provided in the Contract Documents; but no provision of any such instructions will be effective to assign to the AUTHORITY or any of the AUTHORITY's Consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraphs 2.3 or 2.4.

### **6.6 Anticipated Schedules:**

- 6.6.1 Within fourteen (14) calendar days after the date of the Notice to Proceed, the CONTRACTOR shall submit to the Contracting Officer for review an anticipated progress schedule indicating the starting and completion dates of the various stages of the Work. No individual stage of work shall exceed fourteen (14) calendar days.
- 6.6.2 Within twenty one (21) days after the date of the Notice to Proceed, the CONTRACTOR shall submit to the Contracting Officer for review an anticipated schedule of Shop Drawing submissions

- 6.6.3 Prior to submitting the CONTRACTOR's first Application for Payment, the CONTRACTOR shall submit for review and approval:

Anticipated Schedule of Values for all of the Work which will include quantities and prices of items aggregating the Contract Price and will subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work which will be confirmed in writing by the CONTRACTOR at the time of submission.

### **6.7 Finalizing Schedules:**

Prior to processing the first Application for Payment the Contracting Officer and the CONTRACTOR will finalize schedules required by paragraph 6.6. The finalized progress schedule will be acceptable to the AUTHORITY as providing information related to the orderly progression of the Work to completion within the Contract Time; but such acceptance will neither impose on the AUTHORITY nor relieve the CONTRACTOR from full responsibility for the progress or scheduling of the Work. If accepted, the finalized schedule of Shop Drawing and other required submissions will be acknowledgment by the AUTHORITY as providing a workable arrangement for processing the submissions. If accepted, the finalized Schedule of Values will be acknowledgment by the AUTHORITY as an approximation of anticipated value of Work accomplished over the anticipated Contract Time. Receipt and acceptance of a schedule submitted by the CONTRACTOR shall not be construed to assign responsibility for performance or contingencies to the AUTHORITY or relieve the CONTRACTOR of their responsibility to adjust their forces, equipment, and work schedules as may be necessary to insure completion of the Work within prescribed Contract Time. Should the prosecution of the Work be discontinued for any reason, the CONTRACTOR shall notify the Contracting Officer at least 24 hours in advance of resuming operations.

### **6.8 Adjusting Schedules:**

Upon substantial changes to the schedule or upon request the CONTRACTOR shall submit to the Contracting Officer for acceptance (to the extent indicated in paragraph 6.7 and the General Requirements) adjustments in the schedules to reflect the actual present and anticipated progress of the Work.

### **6.9 Substitutes or "Or-Equal" Items:**

- 6.9.1 Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier the naming of the item is intended to establish the type, function and quality required. Unless the name is followed by words indicating that substitution is limited or not permitted, materials or equipment of other Suppliers may be accepted by the Contracting Officer only if sufficient information is submitted by the CONTRACTOR which clearly demonstrates to the Contracting Officer that the material or equipment proposed is equivalent or equal in all aspects to that named. The procedure for review by the Contracting Officer will include the following as supplemented in the General Requirements.
- 6.9.2 Requests for review of substitute items of material and equipment will not be accepted by the Contracting Officer from anyone other than the CONTRACTOR.
- 6.9.3 If the CONTRACTOR wishes to furnish or use a substitute item of material or equipment, the CONTRACTOR shall make written application to the Contracting Officer for Approval thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as the specified. The application will state that the evaluation and Approval of the proposed substitute will not delay the CONTRACTOR's timely achievement of Substantial or Final Completion, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with the AUTHORITY for Work on the Project) to adapt the design to the proposed

substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty.

6.9.4 All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which shall be considered by the AUTHORITY in evaluating the proposed substitute. The AUTHORITY may require the CONTRACTOR to furnish at the CONTRACTOR's expense additional data about the proposed substitute. The Contracting Officer may reject any substitution request which the Contracting Officer determines is not in the best interest of the AUTHORITY.

6.9.5 Substitutions shall be permitted during or after the bid period as allowed and in accordance with Document 00020 - Invitation for Bids, Document 00700 – General Conditions, and Document 01630 - Product Options and Substitutions.

#### **6.10 Substitute Means and Methods:**

If a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents, the CONTRACTOR may furnish or utilize a substitute means, method, sequence, technique or procedure of construction acceptable to the Contracting Officer, if the CONTRACTOR submits sufficient information to allow the Contracting Officer to determine that the substitute proposed is equivalent to that indicated or required by the Contract Documents. The procedure for review by the Contracting Officer will be similar to that provided in paragraph 6.9 as applied by the Contracting Officer and as may be supplemented in the General Requirements.

#### **6.11 Evaluation of Substitution:**

The Contracting Officer will be allowed a reasonable time within which to evaluate each proposed substitute. The Contracting Officer will be the sole judge of acceptability, and no substitute will be ordered, installed or utilized without the Contracting Officer's prior written Approval which will be evidenced by either a Change Order or a Shop Drawing Approved in accordance with Sections 6.20 and 6.21. The Contracting Officer may require the CONTRACTOR to furnish at the CONTRACTOR's expense a special performance guarantee or other Surety with respect to any substitute.

#### **6.12 Dividing the Work:**

The divisions and sections of the Specifications and the identifications of any Drawings shall not control the CONTRACTOR in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

#### **6.13 Subcontractors:**

The CONTRACTOR may utilize the services of appropriately licensed Subcontractors on those parts of the Work which, under normal contracting practices, are performed by Subcontractors, in accordance with the following conditions:

6.13.1 The CONTRACTOR shall not award any Work to any Subcontractor without prior written Approval of the Contracting Officer. This Approval will not be given until the CONTRACTOR submits to the Contracting Officer a written statement concerning the proposed award to the Subcontractor, which shall contain required Equal Employment Opportunity documents, evidence of insurance whose limits are acceptable to the CONTRACTOR, and an executed copy of the subcontract. All subcontracts shall contain provisions for prompt payment, release of retainage, and interest on late payment amounts and retainage as specified in A.S. 36.90.210. Contracts between subcontractors, regardless of tier, must also contain these provisions. No acceptance by the Contracting Officer of any such Subcontractor shall constitute a waiver of any right of the AUTHORITY to reject Defective Work.

- 6.13.2 The CONTRACTOR shall be fully responsible to the AUTHORITY for all acts and omissions of the Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR just as CONTRACTOR is responsible for CONTRACTOR's own acts and omissions.
- 6.13.3 All Work performed for CONTRACTOR by a Subcontractor will be pursuant to an appropriate written agreement between CONTRACTOR and the Subcontractor which specifically binds the Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of the AUTHORITY and contains waiver provisions as required by paragraph 13.17 and termination provisions as required by Article 14.
- 6.13.4 Nothing in the Contract Documents shall create any contractual relationship between the AUTHORITY and any such Subcontractor, Supplier or other person or organization, nor shall it create any obligation on the part of the AUTHORITY to pay or to see to the payment of any moneys due any such Subcontractor, Supplier or other person or organization except as may otherwise be required by Regulatory Requirements. The AUTHORITY will not undertake to settle any differences between or among the CONTRACTOR, Subcontractors, or Suppliers.
- 6.13.5 The CONTRACTOR and Subcontractors shall coordinate their work and cooperate with other trades so to facilitate general progress of Work. Each trade shall afford other trades every reasonable opportunity for installation of their work and storage of materials. If cooperative work of one trade must be altered due to lack of proper supervision, or failure to make proper provisions in time by another trade, such conditions shall be remedied by the CONTRACTOR with no change in Contract Price or Contract Time.
- 6.13.6 The CONTRACTOR shall include on their own payrolls any person or persons working on this Contract who are not covered by written subcontract, and shall ensure that all Subcontractors include on their payrolls all persons performing Work under the direction of the Subcontractor.

**6.14 Use of Premises:**

The CONTRACTOR shall confine construction equipment, the storage of materials and equipment and the operations of workers to the Project limits and approved remote storage sites and lands and areas identified in and permitted by Regulatory Requirements, rights-of-way, permits and easements, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment. The CONTRACTOR shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof or of any land or areas contiguous thereto, resulting from the performance of the Work. Should any claim be made against the AUTHORITY by any such owner or occupant because of the performance of the Work, the CONTRACTOR shall hold the AUTHORITY harmless.

**6.15 Structural Loading:**

The CONTRACTOR shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall the CONTRACTOR subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

**6.16 Record Documents:**

The CONTRACTOR shall maintain in a safe place at the site one record copy of all Drawings, Specifications, Addenda, Directives, Change Orders, Supplemental Agreements, and written interpretations and clarifications (issued pursuant to paragraph 3.6) in good order and annotated to show all changes made during construction. These record documents together with all Approved samples and a counterpart of all Approved Shop Drawings will be available to the Contracting Officer for reference and copying. Upon completion of the Work, the annotated record documents, samples and Shop Drawings will be delivered to the Contracting Officer. Record documents shall accurately record variations in the Work which vary from requirements shown or indicated in the Contract Documents.

### **6.17 Safety and Protection:**

The CONTRACTOR alone shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. The CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

- 6.17.1 All employees on the Work and other persons and organizations who may be affected thereby;
- 6.17.2 All the Work and materials and equipment to be incorporated therein, whether in storage on or off the site; and
- 6.17.3 Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation or replacement in the course of construction.

The CONTRACTOR shall comply with all applicable Regulatory Requirements of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. The CONTRACTOR shall notify owners of adjacent property and utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation and replacement of their property. All damage, injury or loss to any property caused, directly or indirectly, in whole or in part, by the CONTRACTOR, any Subcontractor, Supplier or any other person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, shall be remedied by the CONTRACTOR with no change in Contract Price or Contract Time except as stated in 4.6, except damage or loss attributable to unforeseeable causes beyond the control of and without the fault or negligence of the CONTRACTOR, including but not restricted to acts of God, of the public enemy or governmental authorities. The CONTRACTOR's duties and responsibilities for the safety and protection of the Work shall continue until Final Acceptance (except as otherwise expressly provided in connection with Substantial Completion).

### **6.18 Safety Representative:**

The CONTRACTOR shall designate a responsible safety representative at the site. This person shall be the CONTRACTOR's superintendent unless otherwise designated in writing by the CONTRACTOR to the Contracting Officer.

### **6.19 Emergencies:**

In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, the CONTRACTOR, without special instruction or authorization from the AUTHORITY, is obligated to act to prevent threatened damage, injury or loss. The CONTRACTOR shall give the Contracting Officer prompt written notice if the CONTRACTOR believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby. If the AUTHORITY determines that a change in the Contract Documents is required because of the action taken in response to an emergency, a change will be authorized by one of the methods indicated in Paragraph 9.2, as determined appropriate by the Contracting Officer.

### **6.20 Shop Drawings and Samples:**

- 6.20.1 After checking and verifying all field measurements and after complying with applicable procedures specified in the General Requirements, the CONTRACTOR shall submit to the Contracting Officer for review and Approval in accordance with the accepted schedule of Shop Drawing submissions the required number of all Shop Drawings, which will bear a stamp or specific written indication that the CONTRACTOR has satisfied CONTRACTOR's responsibilities under the Contract Documents with respect to the review of the submission. All submissions will be identified as the Contracting Officer may require. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria,



- materials and similar data to enable the Contracting Officer to review the information as required.
- 6.20.2 The CONTRACTOR shall also submit to the Contracting Officer for review and Approval with such promptness as to cause no delay in Work, all samples required by the Contract Documents. All samples will have been checked by and accompanied by a specific written indication that the CONTRACTOR has satisfied CONTRACTOR's responsibilities under the Contract Documents with respect to the review of the submission and will be identified clearly as to material, Supplier, pertinent data such as catalog numbers and the use for which intended.
- 6.20.3 Before submission of each Shop Drawing or sample the CONTRACTOR shall have determined and verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar data with respect thereto and reviewed or coordinated each Shop Drawing or sample with other Shop Drawings and samples and with the requirements of the Work and the Contract Documents.
- 6.20.4 At the time of each submission the CONTRACTOR shall give the Contracting Officer specific written notice of each variation that the Shop Drawings or samples may have from the requirements of the Contract Documents, and, in addition, shall cause a specific notation to be made on each Shop Drawing submitted to the Contracting Officer for review and Approval of each such variation. All variations of the proposed Shop Drawing from that specified will be identified in the submission and available maintenance, repair and replacement service will be indicated. The submittal will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such variation, including costs of redesign and claims of other Contractors affected by the resulting change, all of which shall be considered by the AUTHORITY in evaluating the proposed variation. If the variation may result in a change of Contract Time or Price, or Contract responsibility, and is not minor in nature; the CONTRACTOR must submit a written request for Change Order with the variation to notify the AUTHORITY of their intent. The AUTHORITY may require the CONTRACTOR to furnish at the CONTRACTOR's expense additional data about the proposed variation. The Contracting Officer may reject any variation request which the Contracting Officer determines is not in the best interest of the AUTHORITY.

#### **6.21 Shop Drawing and Sample Review:**

- 6.21.1 The Contracting Officer will review with reasonable promptness Shop Drawings and samples, but the Contracting Officer's review will be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents and shall not extend to means, methods, techniques, sequences or procedures of construction (except where a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents) or to safety precautions or programs incident thereto. The review of a separate item as such will not indicate acceptance of the assembly in which the item functions. The CONTRACTOR shall make corrections required by the Contracting Officer and shall return the required number of corrected copies of Shop Drawings and submit as required new samples for review. The CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by the Contracting Officer on previous submittals.
- 6.21.2 The Contracting Officer's review of Shop Drawings or samples shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless the CONTRACTOR has in writing advised the Contracting Officer of each such variation at the time of submission as required by paragraph 6.20.4. The Contracting Officer if he so determines, may give written Approval of each such variation by Change Order, except that, if the variation is minor and no Change Order has been requested a specific written notation thereof incorporated in or accompanying the Shop Drawing or sample review comments shall suffice as a modification. Approval by the Contracting Officer will not relieve the CONTRACTOR from responsibility for errors or omissions in the Shop Drawings or from responsibility for having complied with the provisions of paragraph 6.20.3.
- 6.21.3 The AUTHORITY shall be responsible for all DEPARTMENT review costs resulting from the initial submission and the resubmittal. The CONTRACTOR shall, at the discretion of the Contracting Agency, pay all review costs incurred by the AUTHORITY as a result of any additional re-submittals.

6.21.4 Where a Shop Drawing or sample is required by the Specifications, any related Work performed prior to the Contracting Officer's review and Approval of the pertinent submission will be the sole expense and responsibility of the CONTRACTOR.

**6.22 Maintenance during Construction:**

The CONTRACTOR shall maintain the Work during construction and until Substantial Completion, at which time the responsibility for maintenance shall be established in accordance with paragraph 13.10.

**6.23 Continuing the Work:**

The CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with the AUTHORITY. No Work shall be delayed or postponed pending resolution of any disputes, disagreements, or claims except as the CONTRACTOR and the Contracting Officer may otherwise agree in writing.

**6.24 Consent to Assignment:**

The CONTRACTOR shall obtain the prior written consent of the Contracting Officer to any proposed assignment of any interest in, or part of this Contract. The consent to any assignment or transfer shall not operate to relieve the CONTRACTOR or their Sureties of any of their or its obligations under this Contract or the Performance Bonds. Nothing herein contained shall be construed to hinder, prevent, or affect an assignment of monies due, or to become due hereunder, made for the benefit of the CONTRACTOR's creditors pursuant to law.

**6.25 Use of Explosives:**

6.25.1 When the use of explosives is necessary for the prosecution of the Work, the CONTRACTOR shall exercise the utmost care not to endanger life or property, including new Work and shall follow all Regulatory Requirements applicable to the use of explosives. The CONTRACTOR shall be responsible for all damage resulting from the use of explosives.

6.25.2 All explosives shall be stored in a secure manner in compliance with all Regulatory Requirements, and all such storage places shall be clearly marked. Where no Regulatory Requirements apply, safe storage shall be provided no closer than 1,000 feet from any building, camping area, or place of human occupancy.

6.25.3 The CONTRACTOR shall notify each public utility owner having structures in proximity to the site of their intention to use explosives. Such notice shall be given sufficiently in advance to enable utility owners to take such steps as they may deem necessary to protect their property from injury. However, the CONTRACTOR shall be responsible for all damage resulting from the use of the explosives, whether or not, utility owners act to protect their property.

**6.26 CONTRACTOR's Records:**

6.26.1 Records of the CONTRACTOR and Subcontractors relating to personnel, payrolls, invoices of materials, and any and all other data relevant to the performance of this Contract, must be kept on a generally recognized accounting system. Such records must be available during normal work hours to the Contracting Officer for purposes of investigation to ascertain compliance with Regulatory Requirements and provisions of the Contract Documents.

6.26.2 Payroll records must contain the name and address of each employee, their correct classification, rate of pay, daily and weekly number of hours of work, deductions made, and actual wages paid. The CONTRACTOR and Subcontractors shall make employment records available for inspection by the Contracting Officer and representatives of the U.S. and/or State Department of Labor and will permit such representatives to interview employees during working hours on the Project.

6.26.3 Records of all communications between the AUTHORITY and the CONTRACTOR and other

parties, where such communications affected performance of this Contract, must be kept by the CONTRACTOR and maintained for a period of three years from Final Acceptance. The AUTHORITY or its assigned representative may perform an audit of these records during normal work hours after written notice to the CONTRACTOR.

#### 6.27 Load Restrictions

The CONTRACTOR shall comply with all load restrictions as set forth in the "Administrative Permit Manual", and Title 17, Chapter 25, of the Alaska Administrative Code in the hauling of materials on public roads, beyond the limits of the project, and on all public roads within the project limits that are scheduled to remain in use upon completion of the project.

Overload permits may, at the discretion of the State, be issued for travel beyond the project limits for purposes of mobilization and/or demobilization. Issuance of such a permit will not relieve the CONTRACTOR of liability for damage which may result from the moving of equipment.

The operation of equipment of such weight or so loaded as to cause damage to any type of construction will not be permitted. No overloads will be permitted on the base course or surface course under construction. No loads will be permitted on a concrete pavement, base or structure before the expiration of the curing period. The CONTRACTOR shall be responsible for all damage done by their equipment.

### **ARTICLE 7 - LAWS AND REGULATIONS**

#### **7.1 Laws to be observed**

The CONTRACTOR shall keep fully informed of all federal and state Regulatory Requirements and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any manner affect those engaged or employed on the Work, or which in any way affect the conduct of the Work. The CONTRACTOR shall at all times observe and comply with all such Regulatory Requirements, orders and decrees; and shall protect and indemnify the AUTHORITY and its representatives against claim or liability arising from or based on the violation of any such Regulatory Requirement, order, or decree whether by the CONTRACTOR, Subcontractor, or any employee of either. Except where otherwise expressly required by applicable Regulatory Requirements, the AUTHORITY shall not be responsible for monitoring CONTRACTOR's compliance with any Regulatory Requirements.

#### **7.2 Permits, Licenses, and Taxes**

- 7.2.1 The CONTRACTOR shall procure all permits and licenses, pay all charges, fees and taxes, and give all notices necessary and incidental to the due and lawful prosecution of the Work. As a condition of performance of this Contract, the CONTRACTOR shall pay all federal, state and local taxes incurred by the CONTRACTOR, in the performance of this Contract. Proof of payment of these taxes is a condition precedent to final payment by the AUTHORITY under this Contract.
- 7.2.2 The CONTRACTOR's certification that taxes have been paid (as contained in the *Release of Contract*) will be verified with the AUTHORITY of Revenue and Department of Labor, prior to final payment.
- 7.2.3 If any federal, state or local tax is imposed, charged, or repealed after the date of bid opening and is made applicable to and paid by the CONTRACTOR on the articles or supplies herein contracted for, then the Contract shall be increased or decreased accordingly by a Change Order.

#### **7.3 Patented Devices, Materials and Processes**

If the CONTRACTOR employs any design, device, material, or process covered by letters of patent, trademark or copyright, the CONTRACTOR shall provide for such use by suitable legal agreement with the patentee or owner. The CONTRACTOR and the Surety shall indemnify and save harmless the AUTHORITY, any affected third party, or political subdivision from any and all claims for infringement by reason of the use of any such patented design, device, material or process, or any

trademark or copyright, and shall indemnify the AUTHORITY for any costs, expenses, and damages which it may be obliged to pay by reason of any infringement, at any time during the prosecution or after the completion of the Work.

#### **7.4 Compliance of Specifications and Drawings:**

If the CONTRACTOR observes that the Specifications and Drawings supplied by the AUTHORITY are at variance with any Regulatory Requirements, CONTRACTOR shall give the Contracting Officer prompt written notice thereof, and any necessary changes will be authorized by one of the methods indicated in paragraph 9.2. As determined appropriate by the Contracting Officer. If the CONTRACTOR performs any Work knowing or having reason to know that it is contrary to such Regulatory Requirements, and without such notice to the Contracting Officer, the CONTRACTOR shall bear all costs arising therefrom; however, it shall not be the CONTRACTOR's primary responsibility to make certain that the Specifications and Drawings supplied by the AUTHORITY are in accordance with such Regulatory Requirements.

#### **7.5 Accident Prevention:**

The CONTRACTOR shall comply with AS 18.60.075 and all pertinent provisions of the Construction Code Occupational Safety and Health Standards issued by the Alaska Department of Labor.

#### **7.6 Sanitary Provisions:**

The CONTRACTOR shall provide and maintain in a neat and sanitary condition such accommodations for the use of their employees and DEPARTMENT representatives as may be necessary to comply with the requirements of the State and local Boards of Health, or of other bodies or tribunals having jurisdiction.

#### **7.7 Business Registration:**

Comply with AS 08.18.011, as follows: "it is unlawful for a person to submit a bid or work as a contractor until he has been issued a certificate of registration by the AUTHORITY of Commerce. A partnership or joint venture shall be considered registered if one of the general partners or ventures whose name appears in the name under which the partnership or venture does business is registered."

#### **7.8 Professional Registration and Certification:**

All craft trades, architects, engineers and land surveyors, electrical administrators, and explosive handlers employed under the Contract shall specifically comply with applicable provisions of AS 08.18, 08.48, 08.40, and 08.52. Provide copies of individual licenses within seven days following a request from the Contracting Officer.

#### **7.9 Local Building Codes:**

The CONTRACTOR shall comply with AS 35.10.025 which requires construction in accordance with applicable local building codes to include the obtaining of required permits.

#### **7.10 Air Quality Control:**

The CONTRACTOR shall comply with all applicable provisions of AS 46.03.04 as pertains to Air Pollution Control.

#### **7.11 Archaeological or Paleontological Discoveries:**

When the CONTRACTOR's operation encounters prehistoric artifacts, burials, remains of dwelling sites, or paleontological remains, such as shell heaps, land or sea mammal bones or tusks, the CONTRACTOR shall cease operations immediately and notify the Contracting Officer. No artifacts or

specimens shall be further disturbed or removed from the ground and no further operations shall be performed at the site until so directed. Should the Contracting Officer order suspension of the CONTRACTOR's operations in order to protect an archaeological or historical finding, or order the CONTRACTOR to perform extra Work, such shall be covered by an appropriate Contract change document.

## **7.12 Applicable Alaska Preferences:**

- 7.12.1 In determining the low bidder for State funded projects, a 5% bid preference has been given to "Alaska bidders", as required under AS 36.30.170. "Alaska bidder" means a person who:
- (1) holds a current Alaska business license;
  - (2) submits a bid for goods, services, or construction under the name as appearing on the person's current Alaska business license
  - (3) has maintained a place of business within the state staffed by the bidder or an employee of the bidder for a period of six months immediately preceding the date of the bid;
  - (4) is incorporated or qualified to do business under the laws of the state, is a sole proprietorship, and the proprietor is a resident of the state or is a partnership, and all partners are residents of the state; and
  - (5) if a joint venture, is composed entirely of ventures that qualify under (1) through (4), above.
- 7.12.2 In determining the low bidder for State funded projects, an "Alaska products" preference has been given as required under AS 36.30.326 - 36.30.332, when the bidder designates the use of Alaska products. The Bidder shall complete the Alaska Products Preference Worksheet per its instructions and submit it with the Bid Proposal. If the successful Bidder/CONTRACTOR proposes to use an Alaska product and does not do so, a penalty will be assessed against the successful Bidder/CONTRACTOR in an amount equal to the product preference percentage granted to the successful Bidder/CONTRACTOR plus one percent multiplied by the total declared value of the Alaska products proposed but not used.
- 7.12.3 Pursuant to AS 36.15.050 and AS 36.30.322, "agricultural/wood" products harvested in Alaska shall be used in State funded projects whenever they are priced no more than seven percent above agricultural/wood products harvested outside the state and are of a like quality as compared with agricultural/wood products harvested outside the state, when such products are not utilized, the CONTRACTOR shall document the efforts he made towards obtaining agricultural/wood products harvested in Alaska and include in this documentation a written statement that he contacted the manufacturers and suppliers identified on the AUTHORITY of Commerce and Economic Development's list of suppliers of Alaska forest products concerning the availability of agricultural/wood products harvested in Alaska and, if available, the product prices. The CONTRACTOR's use of agricultural/wood products that fail to meet the requirements of this section shall be subject to the provisions of paragraphs 12.6 through 12.9 relating to Defective Work.
- 7.12.4 The CONTRACTOR shall maintain records, in a format acceptable to the Contracting Officer, which establish the type and extent of "agricultural/wood" and "Alaska" products utilized. All record keeping and documentation associated with the requirements 7.12.2 and 7.12.3 of this paragraph, must be provided to the AUTHORITY upon written request or as otherwise provided within the Contract Documents.

## **7.13 Wages and Hours of Labor:**

- 7.13.1 One certified copy of all payrolls shall be submitted weekly to the State Department of Labor and, upon request, to the Contracting Officer to assure to assure compliance with AS 36.05.040, *Filing Schedule of Employees Wages Paid and Other Information*. The CONTRACTOR shall be responsible for the submission of certified copies of payrolls of all Subcontractors. The certification shall affirm that the payrolls are current and complete, that the wage rates contained therein are not less than the applicable rates referenced in these Contract Documents, and that the classification set forth for each laborer or mechanic conforms to the Work he performed. The CONTRACTOR and their Subcontractors shall attend all hearings and conferences and produce

such books, papers, and documents all as requested by the AUTHORITY of Labor. Should federal funds be involved, the appropriate federal agency shall also receive a copy of the CONTRACTOR's certified payrolls. Regardless of project funding source, copies of all certified payrolls supplied to the State Department of Labor by the CONTRACTOR shall be supplied also to the Project Manager upon request, including submittals made by, or on behalf of, subcontractors.

7.13.2 The following labor provisions shall also apply to this Contract:

- a. The CONTRACTOR and their Subcontractors shall pay all employees unconditionally and not less than once a week;
- b. wages may not be less than those stated under AS 36.05.010, regardless of the contractual relationship between the CONTRACTOR or Subcontractors and laborers, mechanics, or field surveyors;
- c. the scale of wages to be paid shall be posted by the CONTRACTOR in a prominent and easily accessible place at the site of the Work;
- d. the AUTHORITY shall withhold so much of the accrued payments as is necessary to pay to laborers, mechanics, or field surveyors employed by the CONTRACTOR or Subcontractors the difference between
  1. the rates of wages required by the Contract to be paid laborers, mechanics, or field surveyors on the Work, and
  2. the rates of wages in fact received by laborers, mechanics or field surveyors.

7.13.3 Within three calendar days of award of a construction contract, the CONTRACTOR shall file a "Notice of Work" with the AUTHORITY of Labor and shall pay all related fees. The Contracting Officer will not issue Notice to Proceed to the CONTRACTOR until such notice and fees have been paid to the State Department of Labor. Failure of the CONTRACTOR to file the Notice of Work and pay fees within this timeframe shall not constitute grounds for an extension of contract time or adjustment of contract price.

#### **7.14 Overtime Work Hours and Compensation:**

Pursuant to 40 U.S.C. 327-330 and AS 23.10.060 - .110, the CONTRACTOR shall not require nor permit any laborer or mechanic in any workweek in which he is employed on any Work under this Contract to work in excess of eight hours in any Calendar Day or in excess of forty hours in such workweek on Work subject to the provisions of the *Contract Work Hours and Safety Standards Act* unless such laborer or mechanic receives compensation at a rate not less than one and one half times their basic rate of pay for all such hours worked in excess of eight hours in any Calendar Day or in excess of forty hours in such workweek whichever is the greater number of overtime hours. In the event of any violation of this provision, the CONTRACTOR shall be liable to any affected employee for any amounts due and penalties and to the AUTHORITY for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic employed in violation of this provision in the sum of \$10.00 for each Calendar Day on which such employee was required or permitted to be employed on such Work in excess of eight hours or in excess of the standard workweek of forty hours without payment of the overtime wages required by this paragraph.

### **ARTICLE 8 - OTHER WORK**

#### **8.1 Related Work at Site:**

- 8.1.1 The AUTHORITY reserves the right at any time to contract for and perform other or additional work on or near the Work covered by the Contract.
- 8.1.2 When separate contracts are let within the limits of the Project, the CONTRACTOR shall conduct

their Work so as not to interfere with or hinder the work being performed by other contractors. The CONTRACTOR when working on the same Project with other contractors shall cooperate with such other contractors. The CONTRACTOR shall join their Work with that of the others in an acceptable manner and shall perform it in proper sequence to that of others.

- 8.1.3 If the fact that other such work is to be performed is identified or shown in the Contract Documents the CONTRACTOR shall assume all liability, financial or otherwise, in connection with this Contract and indemnify and save harmless the AUTHORITY from any and all damages or claims that may arise because of inconvenience, delay, or loss experienced by the CONTRACTOR because of the presence and operations of other contractors.
- 8.1.4 If the fact that such other work is to be performed was not identified or shown in the Contract Documents, written notice thereof will be given to the CONTRACTOR prior to starting any such other work. If the CONTRACTOR believes that such performance will require an increase in Contract Price or Contract Time, the CONTRACTOR shall notify the Contracting Officer of such required increase within fifteen (15) calendar days following receipt of the Contracting Officer's notice. Should the Contracting Officer find such increase(s) to be justified, a Change Order will be executed.

## **8.2 Access, Cutting, and Patching:**

The CONTRACTOR shall afford each utility owner and any other contractor who is a party to such a direct contract with the AUTHORITY (or the AUTHORITY, if the AUTHORITY is performing the additional work with the AUTHORITY's employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such work, and shall properly connect and coordinate the Work with the work of others. The CONTRACTOR shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work, the CONTRACTOR shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter such other work with the written consent of the Contracting Officer. The duties and responsibilities of the CONTRACTOR under this paragraph are for the benefit of other contractors to the extent that there are comparable provisions for the benefit of the CONTRACTOR in said direct contracts between the AUTHORITY and other contractors.

## **8.3 Defective Work by Others:**

If any part of the CONTRACTOR's Work depends for proper execution or results upon the work of any such other contractor, utility owner, or the AUTHORITY, the CONTRACTOR shall inspect and promptly report to the Contracting Officer in writing any delays, defects or deficiencies in such work that render it unavailable or unsuitable for such proper execution and results. The CONTRACTOR's failure to so report will constitute an acceptance of the other work as fit and proper for integration with CONTRACTOR's Work except for latent or non-apparent defects and deficiencies in the other work.

## **8.4 Coordination:**

If the AUTHORITY contracts with others for the performance of other work at the site, Contracting Officer will have authority and responsibility for coordination of the activities among the various prime contractors.

# **ARTICLE 9 - CHANGES**

## **9.1 DEPARTMENT's Right to Change**

Without invalidating the Contract and without notice to any Surety, the AUTHORITY may, at any time or from time to time, order additions, deletions or revisions in the Work within the general scope of the Contract, including but not limited to changes:

- 9.1.1 In the Contract Documents;

- 9.1.2 In the method or manner of performance of the Work;
- 9.1.3 In State-furnished facilities, equipment, materials, services, or site;
- 9.1.4 Directing acceleration in the performance of the Work.

## **9.2 Authorization of Changes within the General Scope.**

Additions, deletions, or revisions in the Work within the general scope of the Contract as specified in 9.1 shall be authorized by one or more of following ways:

- 9.2.1 Directive (pursuant to paragraph 9.3)
- 9.2.2 A Change Order (pursuant to paragraph 9.4)
- 9.2.3 DEPARTMENT's acceptance of Shop Drawing variations from the Contract Documents as specifically identified by the CONTRACTOR as required by paragraph 6.20.4.

## **9.3 Directive**

- 9.3.1 The Contracting Officer shall provide written clarification or interpretation of the Contract Documents (pursuant to paragraph 3.6).
- 9.3.2 The Contracting Officer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Time and are consistent with the overall intent of the Contract Documents.
- 9.3.3 The Contracting Officer may order the Contractor to correct Defective Work or methods which are not in conformance with the Contract Documents.
- 9.3.4 The Contracting Officer may direct the commencement or suspension of Work or emergency related Work (as provided in paragraph 6.19).
- 9.3.5 Upon the issuance of a Directive to the CONTRACTOR by the Contracting Officer, the CONTRACTOR shall proceed with the performance of the Work as prescribed by such Directive.
- 9.3.6 If the CONTRACTOR believes that the changes noted in a Directive may cause an increase in the Contract Price or an extension of Contract Time, the CONTRACTOR shall immediately provide written notice to the Contracting Officer depicting such increases before proceeding with the Directive, except in the case of an emergency. If the Contracting Officer finds the increase in Contract Price or the extension of Contract Time justified, a Change Order will be issued. If however, the Contracting Officer does not find that a Change Order is justified, the Contracting Officer may direct the CONTRACTOR to proceed with the Work. The CONTRACTOR shall cooperate with the Contracting Officer in keeping complete daily records of the cost of such Work. If a Change Order is ultimately determined to be justified, in the absence of agreed prices and unit prices, payment for such Work will be made on a "cost of the work basis" as provided in 10.4

## **9.4 Change Order**

A change in Contract Time, Contract Price, or responsibility may be made for changes within the scope of the Work by Change Order. Upon receipt of an executed Change Order, the CONTRACTOR shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents except as otherwise specifically provided. Changes in Contract Price and Contract Time shall be made in accordance with Articles 10 and 11. A Change Order shall be considered executed when it is signed by the AUTHORITY.



## **9.5 Shop Drawing Variations**

Variations by shop drawings shall only be eligible for consideration under 9.4 when the conditions affecting the price, time, or responsibility are identified by the CONTRACTOR in writing and a request for a Change Order is submitted as per 6.20.4.

## **9.6 Changes outside the General Scope; Supplemental Agreement**

Any change which is outside the general scope of the Contract, as determined by the Contracting Officer, must be authorized by a Supplemental Agreement signed by the appropriate representatives of the AUTHORITY and the CONTRACTOR.

## **9.7 Unauthorized Work:**

The CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Time with respect to any work performed that is not required by the Contract Documents as amended, modified and supplemented as provided in this Article 9, except in the case of an emergency as provided in paragraph 6.19 and except in the case of uncovering Work as provided in paragraph 12.4.2.

## **9.8 Notification of Surety:**

If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Time) is required by the provisions of any bond to be given to a Surety, the giving of any such notice will be the CONTRACTOR's responsibility, and the amount of each applicable bond will be adjusted accordingly.

## **9.9 Differing Site Conditions:**

9.9.1 The CONTRACTOR shall promptly, and before such conditions are disturbed (except in an emergency as permitted by paragraph 6.19), notify the Contracting Officer in writing of: (1) subsurface or latent physical conditions at the site differing materially from those indicated in the Contract, and which could not have been discovered by a careful examination of the site, or (2) unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this Contract. The Contracting Officer shall promptly investigate the conditions, and if the Contracting Officer finds that such conditions do materially so differ and cause an increase or decrease in the CONTRACTOR's cost of, or time required for, performance of this Contract, an adjustment shall be made and the Contract modified in writing accordingly. An adjustment in compensation shall be computed under Article 10.

9.9.2 Any claim for additional compensation by the CONTRACTOR under this clause shall be made in accordance with Article 15. In the event that the Contracting Officer and the CONTRACTOR are unable to reach an agreement concerning an alleged differing site condition, the CONTRACTOR will be required to keep an accurate and detailed record which will indicate the actual "cost of the work" done under the alleged differing site condition. Failure to keep such a record shall be a bar to any recovery by reason of such alleged differing site conditions. The Contracting Officer shall be given the opportunity to supervise and check the keeping of such records.

## **9.10 Interim Work Authorization**

An Interim Work Authorization may be used to establish a change within the scope of the Work; however, only a Change Order shall establish associated changes in Contract Time and Price. Work authorized by Interim Work Authorization shall be converted to a Change Order. The basis of payment shall be as stated in the Interim Work Authorization, unless it states that the basis of payment has not been established and is to be negotiated, in which case the Cost of the Work shall be documented pursuant to Article 10.4, to establish a basis for negotiating a lump sum

price for the Change Order.

## **ARTICLE 10 - CONTRACT PRICE; COMPUTATION AND CHANGE**

### **10.1 Contract Price:**

The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to the CONTRACTOR for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by the CONTRACTOR shall be at their expense without change in the Contract Price. The Contract Price may only be changed by a Change Order or Supplemental Agreement.

### **10.2 Claim for Price Change:**

Any claim for an increase or decrease in the Contract Price shall be submitted in accordance with the terms of Article 15, and shall not be allowed unless notice requirements of this Contract have been met.

### **10.3 Change Order Price Determination:**

10.3.1 Before a Change Order or Supplemental Agreement is approved, the CONTRACTOR shall submit cost or pricing data regarding the changed or extra Work. The CONTRACTOR shall certify that the data submitted is, to their best knowledge and belief, accurate, complete and current as of a mutually determined specified date and that such data will continue to be accurate and complete during the performance of the changed or extra Work.

### **10.4 Cost of the Work:**

The term "cost of the work" means the sum of all costs necessarily incurred and paid by the CONTRACTOR in the proper performance of the Work. Except as otherwise may be agreed to in writing by the AUTHORITY, such costs shall be in amount no higher than those prevailing in the locality of the Project, shall include only the following items and shall not include any of the costs itemized in subparagraph 10.5:

- 10.4.1 Payroll costs for employees in the direct employ of the CONTRACTOR in the performance of the Work under schedules of job classifications agreed upon by the AUTHORITY and the CONTRACTOR. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall be limited to, salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, workers' or workmen's compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. Such employees shall include manual workers up through the level of foreman but shall not include general foremen, superintendents, and non-manual employees. The expenses of performing Work after regular working hours, on Saturday, Sunday or legal holidays, shall be included in the above to the extent authorized by the AUTHORITY.
- 10.4.2 Cost of all materials and equipment furnished and incorporated or consumed in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to the CONTRACTOR unless the AUTHORITY deposits funds with the CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to the AUTHORITY. All trade discounts, rebates and refunds and all returns from sale of surplus materials and equipment shall accrue to the AUTHORITY, and the CONTRACTOR shall make provisions so that they may be obtained.
- 10.4.3 Payments made by the CONTRACTOR to Subcontractors for Work performed by Subcontractors. If required by the AUTHORITY, CONTRACTOR shall obtain competitive quotes from Subcontractors or Suppliers acceptable to the CONTRACTOR and shall deliver such quotes to the AUTHORITY who will then determine which quotes will be accepted. If a subcontract provides that the Subcontractor is to be paid on the basis of "cost of the work" plus a fee, the Subcontractor' "cost of the work" shall be determined in the same manner as the

CONTRACTOR's "cost of work" as described in paragraphs 10.4 through 10.5; and the Subcontractor's fee shall be established as provided for under subparagraph 10.6.2 clause b. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.

10.4.4 Costs of special consultants (including but not limited to engineers, architects, testing laboratories, and surveyors) employed for services necessary for the completion of the Work.

10.4.5 Supplemental costs including the following:

- a. The proportion of necessary transportation, travel and subsistence expenses of the CONTRACTOR's employees incurred in discharge of duties connected with the Work.
- b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the site and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost less market value of such items used but not consumed which remain the property of the CONTRACTOR.
- c. Rentals of all construction equipment and machinery and the parts thereof whether rented from the CONTRACTOR or others in accordance with rental agreements Approved by the AUTHORITY and the costs of transportation, loading, unloading, installation, dismantling and removal thereof - all in accordance with terms of said rental agreements. The rental of any such equipment, machinery or parts shall cease when the use thereof is no longer necessary for the Work.

For any machinery or special equipment (other than small tools) which has been authorized by the Project Manager, the CONTRACTOR shall receive the rental rates in the current edition and appropriate volume of the "Rental Rate Blue Book for Construction Equipment", published by Dataquest, Inc., 1290 Ridder Park Drive, San Jose, CA 95131. Hourly rental rates shall be determined as follows:

*The established hourly rental rate shall be equal to the adjusted monthly rate for the basic equipment plus the adjusted monthly rate for applicable attachments, both divided by 176, and multiplied by the area adjustment factor, plus the estimated hourly operating cost.*

The adjusted monthly rate is that resulting from application of the rate adjustment formula in order to eliminate replacement cost allowances in machine depreciation and contingency cost allowances.

Attachments shall not be included unless required for the time and materials work.

For equipment not listed in The Blue Book, the CONTRACTOR shall receive a rental rate as agreed upon before such work is begun. If agreement cannot be reached, the AUTHORITY reserves the right to establish a rate based on similar equipment in the Blue Book or prevailing commercial rates in the area.

These rates shall apply for equipment used during the CONTRACTOR's regular shift of 10 hours per day. Where the equipment is used more than 10 hours per day, either on the CONTRACTOR's normal work or on time and materials, and either on single or multiple shifts, an overtime rate, computed as follows, shall apply:

*The hourly overtime rate shall be equal to the adjusted monthly rate for the basic equipment plus the adjusted monthly rate for applicable attachments, both divided by 352, and multiplied by the area adjustment factor, plus the estimated hourly operating cost.*

Equipment which must be rented or leased specifically for work required under this section shall be authorized in writing by the Project Manager. The CONTRACTOR shall be paid invoice price plus 15%.

When it is necessary to obtain equipment from sources beyond the project limits exclusively for time and materials, work, the actual cost of transferring the equipment to the site of the work and return will be allowed as an additional item of expense. Where the move is made by common carrier, the move-in allowance will be limited to the amount of the freight bill or invoice. If the CONTRACTOR hauls the equipment with their own forces, the allowance will be limited to the rental rate for the hauling unit plus operator wages. In the event that the equipment is transferred under its own power, the moving allowance will be limited to one-half of the normal hourly rental rate plus operator's wages. In the event that the move-out is to a different location, payment will in no instance exceed the amount of the move-in. Move-in allowance shall not be made for equipment brought to the project for time and materials work which is subsequently retained on the project and utilized for completion of contract items, camp maintenance, or related work.

Equipment ordered to be on a stand-by basis shall be paid for at the stand-by rental rate for the number of hours in the CONTRACTOR'S normal work shift, but not to exceed 8 hours per day. The stand-by rental rate shall be computed as follows:

*The hourly stand-by rate shall be equal to the adjusted monthly rate for the basic equipment plus the adjusted monthly rate for applicable attachments, both divided by 352, and all multiplied by the area adjustment factor.*

Time will be recorded to the nearest one-quarter hour for purposes of computing compensation to the CONTRACTOR for equipment utilized under these rates.

The equipment rates as determined above shall be full compensation, including overhead and profit, for providing the required equipment and no additional compensation will be made for other costs such as, but not limited to, fuels, lubricants, replacement parts or maintenance costs. Cost of repairs, both major and minor, as well as charges for mechanic's time utilized in servicing equipment to ready it for use prior to moving to the project and similar charges will not be allowed.

- d. Sales, consumer, use or similar taxes related to the Work, and for which the CONTRACTOR is liable, imposed by Regulatory Requirements.
- e. Deposits lost for causes other than negligence of the CONTRACTOR, any Subcontractor or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses), not compensated by insurance or otherwise, to the Work or otherwise sustained by the CONTRACTOR in connection with the performance and furnishing of the Work provided they have resulted from causes other than the negligence of the CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and Approval of the AUTHORITY. No such losses, damages and expenses shall be included in the "cost of the work" for the purpose of determining the CONTRACTOR's fee. If, however, any such loss or damage requires reconstruction and the CONTRACTOR is placed in charge thereof, the CONTRACTOR shall be paid for services a fee proportionate to that stated in paragraphs 10.6.2.a and 10.6.2.b.
- g. The cost of utilities, fuel and sanitary facilities at the site.
- h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the Work.
- i. Cost of premiums for additional bonds and insurance required because of changes in the Work and premiums for property insurance coverage within the limits of the deductible amounts established by the AUTHORITY in accordance with Article 5.

## **10.5 Excluded Costs:**

The term "cost of the work" shall not include any of the following:

- 10.5.1 Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agency, expeditors, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the site or in CONTRACTOR's principal or a branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in paragraph 10.4.1 or specifically covered by paragraph 10.4.4 all of which are to be considered administrative costs covered by the CONTRACTOR's fee.
- 10.5.2 Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the site.
- 10.5.3 Any part of CONTRACTOR's capital expenses including interest on CONTRACTOR's capital employed for the Work and charges against CONTRACTOR for delinquent payments.
- 10.5.4 Cost of premiums for all bonds and for all insurance whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same (except for the cost of premiums covered by subparagraph 10.4.5.i above).
- 10.5.5 Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of Defective Work, disposal of materials or equipment wrongly supplied and making good any damage to property.
- 10.5.6 Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraph 10.4.

## **10.6 CONTRACTOR's Fee:**

The CONTRACTOR's fee allowed to CONTRACTOR for overhead and profit shall be determined as follows.

- 10.6.1 A mutually acceptable fixed fee; or if none can be agreed upon.
- 10.6.2 A fee based on the following percentages of the various portions of the "cost of the work":
  - a. For costs incurred under paragraphs 10.4.1 and 10.4.2, the CONTRACTOR's fee shall be fifteen percent;
  - b. For costs incurred under paragraph 10.4.3, the CONTRACTOR's fee shall be ten percent; and if a subcontract is on the basis of "cost of the work" plus a fee, the maximum allowable to CONTRACTOR on account of overhead and profit for itself and all Subcontractors and multiple tiers thereof shall be fifteen percent of the cost incurred by the subcontractor actually performing the work;
  - c. No fee shall be payable on the basis of costs itemized under paragraphs 10.4.4, 10.4.5 and 10.5;
  - d. The amount of credit to be allowed by the CONTRACTOR to the AUTHORITY for any such change which results in a net decrease in cost will be the amount of the actual net decrease plus a deduction in CONTRACTOR's fee by an amount equal to fifteen percent of the net decrease; and
  - e. When both additions and credits are involved in any one change, the adjustment in CONTRACTOR's fee shall be computed on the basis of the net change in accordance with paragraphs 10.6.2.a through 10.6.2.d, inclusive.

## **10.7 Cost Breakdown:**

Whenever the cost of any Work is to be determined pursuant to paragraphs 10.4 and 10.5, the CONTRACTOR will submit in a form acceptable to the AUTHORITY an itemized cost breakdown together with supporting data.

## **10.8 Cash Allowances:**

It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be done by such Subcontractors or Suppliers and for such sums within the limit of the allowances as may be acceptable to the Contracting Officer. CONTRACTOR agrees that:

- 10.8.1 The allowances include the cost to CONTRACTOR (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the site, and all applicable taxes; and
- 10.8.2 CONTRACTOR's cost for unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances. No demand for additional payment on account of any thereof will be valid.

Prior to final payment, an appropriate Change Order will be issued to reflect actual amounts due the CONTRACTOR on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

## **10.9 Unit Price Work:**

- 10.9.1 Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the established unit prices for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Contract. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by the CONTRACTOR will be made by the AUTHORITY in accordance with paragraph 10.10.
- 10.9.2 Each unit price will be deemed to include an amount considered by the CONTRACTOR to be adequate to cover the CONTRACTOR's overhead and profit for each separately identified item. If the "Basis of Payment" clause in the Contract Documents relating to any unit price in the bid schedule requires that the said unit price cover and be considered compensation for certain work or material essential to the item, this same work or material will not also be measured or paid for under any other pay item which may appear elsewhere in the Contract Documents.
- 10.9.3 Payment to the CONTRACTOR shall be made only for the actual quantities of Work performed and accepted or materials furnished, in conformance with the Contract Documents. When the accepted quantities of Work or materials vary from the quantities stated in the bid schedule, or change documents, the CONTRACTOR shall accept as payment in full, payment at the stated unit prices for the accepted quantities of Work and materials furnished, completed and accepted; except as provided below:
  - a. When the quantity of Work to be done or material to be furnished under any item, for which the total cost of the item exceeds 10% of the total Contract Price, is increased by more than 25 percent of the quantity stated in the bid schedule, or change documents, either party to the Contract, upon demand, shall be entitled to an equitable unit price adjustment on that portion of the Work above 125 percent of the quantity stated in the bid schedule.
  - b. When the quantity of Work to be done or material to be furnished under any major item, for which the total cost of the item exceeds 10% of the total Contract Price, is decreased by more than 25

percent of the quantity stated in the bid schedule, or change documents either party to the Contract, upon demand, shall be entitled to an equitable price adjustment for the quantity of Work performed or material furnished, limited to a total payment of not more than 75 percent of the amount originally bid for the item.

#### **10.10 Determinations for Unit Prices:**

The Contracting Officer will determine the actual quantities and classifications of Unit Price Work performed by the CONTRACTOR. The Contracting Officer will review with the CONTRACTOR preliminary determinations on such matters before finalizing the costs and quantities on the Schedule of Values. The Contracting Officer's acknowledgment thereof will be final and binding on the CONTRACTOR, unless, within 10 days after the date of any such decisions, the CONTRACTOR delivers to the Contracting Officer written notice of intention to appeal from such a decision.

### **ARTICLE 11 - CONTRACT TIME; COMPUTATION AND CHANGE**

#### **11.1 Commencement of Contract Time; Notice to Proceed:**

The Contract Time will commence to run on the day indicated in the Notice to Proceed.

#### **11.2 Starting the Work:**

No Work on Contract items shall be performed before the effective date of the Notice to Proceed. The CONTRACTOR shall notify the Contracting Officer at least 24 hours in advance of the time actual construction operations will begin. The CONTRACTOR may request a limited Notice to Proceed after Award has been made, to permit him to order long lead materials which could cause delays in Project completion. However, granting is within the sole discretion of the Contracting Officer, and refusal or failure to grant a limited Notice to Proceed shall not be a basis for claiming for delay, extension of time, or alteration of price.

#### **11.3 Computation of Contract Time:**

11.3.1 When the Contract Time is specified on a Calendar Day basis, all Work under the Contract shall be completed within the number of Calendar Days specified. The count of Contract Time begins on the day following receipt of the Notice to Proceed by the CONTRACTOR, if no starting day is stipulated therein.

Calendar Days shall continue to be counted against Contract Time until and including the date of Substantial Completion of the Work.

11.3.2 When the Contract completion time is specified as a fixed calendar date, it shall be the date of Substantial Completion.

11.3.3 The Contract Time shall be as stated on form 25D-9, Proposal.

#### **11.4 Time Change:**

The Contract Time may only be changed by a Change Order or Supplemental Agreement.

#### **11.5 Extension Due to Delays:**

The right of the CONTRACTOR to proceed shall not be terminated nor the CONTRACTOR charged with liquidated or actual damages because of delays to the completion of the Work due to unforeseeable causes beyond the control and without the fault or negligence of the CONTRACTOR, including, but not restricted to the following: acts of God or of the public enemy, acts of the AUTHORITY in its contractual capacity, acts of another contractor in the performance of a contract with the AUTHORITY, floods, fires, epidemics, quarantine restrictions, strikes, freight embargoes, unusually severe weather and delays of Subcontractors or Suppliers due to such causes. Any delay in receipt of materials on the site, caused by other than one of the specifically mentioned occurrences

above, does not of itself justify a time extension, provided that the CONTRACTOR shall within twenty four (24) hours from the beginning of any such delay (unless the Contracting Officer shall grant a further period of the time prior to the date of final settlement of the Contract), notify the Contracting Officer in writing of the cause of delay. The Contracting Officer shall ascertain the facts and the extent of the delay and extend the time for completing the Work when the findings of fact justify such an extension.

#### **11.6 Essence of Contract:**

All time limits stated in the Contract Documents are of the essence of the Contract.

#### **11.7 Reasonable Completion Time:**

It is expressly understood and agreed by and between the CONTRACTOR and the AUTHORITY that the date of beginning and the time for Final Completion of the Work described herein are reasonable times for the completion of the Work.

#### **11.8 Delay Damages:**

Whether or not the CONTRACTOR's right to proceed with the Work is terminated, he and their Sureties shall be liable for damages resulting from their refusal or failure to complete the Work within the specified time.

Liquidated and actual damages for delay shall be paid by the CONTRACTOR or their Surety to the AUTHORITY in the amount as specified in the Supplementary Conditions for each Calendar Day the completion of the Work or any part thereof is delayed beyond the time required by the Contract, or any extension thereof. If a listing of incidents resulting from a delay and expected to give rise to actual or liquidated damages is not established by the Contract Documents, then the CONTRACTOR and their Surety shall be liable to the AUTHORITY for any actual damages occasioned by such delay. The CONTRACTOR acknowledges that the liquidated damages established herein are not a penalty but rather constitute an estimate of damages that the AUTHORITY will sustain by reason of delayed completion. These liquidated and actual damages are intended as compensation for losses anticipated to arise, and include those items enumerated in the Supplementary Conditions.

These damages will continue to run both before and after termination in the event of default termination. These liquidated damages do not cover excess costs of completion or DEPARTMENT costs, fees, and charges related to re-procurement. If a default termination occurs, the CONTRACTOR or their Surety shall pay in addition to these damages, all excess costs and expenses related to completion as provided by Article 14.2.5.

### **ARTICLE 12 - QUALITY ASSURANCE**

#### **12.1 Warranty and Guaranty:**

The CONTRACTOR warrants and guarantees to the AUTHORITY that all Work will be in accordance with the Contract Documents and will not be Defective. Prompt notice of all defects shall be given to the CONTRACTOR. All Defective Work, whether or not in place, may be rejected, corrected or accepted as provided for in this article.

#### **12.2 Access to Work:**

The AUTHORITY and the AUTHORITY's representatives, testing agencies and governmental agencies with jurisdiction interests will have access to the Work at reasonable times for their observation, inspecting and testing. The CONTRACTOR shall provide proper and safe conditions for such access.

#### **12.3 Tests and Inspections:**

12.3.1 The CONTRACTOR shall give the Contracting Officer timely notice of readiness of the Work for



all required inspections, tests or Approvals.

- 12.3.2 If Regulatory Requirements of any public body having jurisdiction require any Work (or part thereof) to specifically be inspected, tested or approved, the CONTRACTOR shall assume full responsibility therefor, pay all costs in connection therewith and furnish the Contracting Officer the required certificates of inspection, testing or approval. The CONTRACTOR shall also be responsible for and shall pay all costs in connection with any inspection or testing required in connection with DEPARTMENT's acceptance of a Supplier of materials or equipment proposed to be incorporated in the Work, or of materials or equipment submitted for Approval prior to the CONTRACTOR's purchase thereof for incorporation in the Work. The cost of all inspections, tests and approvals in addition to the above which are required by the Contract Documents shall be paid by the CONTRACTOR. The AUTHORITY may perform additional tests and inspections which it deems necessary to insure quality control. All such failed tests or inspections shall be at the CONTRACTOR's expense.
- 12.3.4 If any Work (including the work of others) that is to be inspected, tested or approved is covered without written concurrence of the Contracting Officer, it must, if requested by the Contracting Officer, be uncovered for observation. Such uncovering shall be at the CONTRACTOR's expense unless the CONTRACTOR has given the Contracting Officer timely notice of CONTRACTOR's intention to cover the same and the Contracting Officer has not acted with reasonable promptness in response to such notice.
- 12.3.5 Neither observations nor inspections, tests or Approvals by the AUTHORITY or others shall relieve the CONTRACTOR from the CONTRACTOR's obligations to perform the Work in accordance with the Contract Documents.

#### **12.4 Uncovering Work:**

- 12.4.1 If any Work is covered contrary to the written request of the Contracting Officer, it must, if requested by the Contracting Officer, be uncovered for the Contracting Officer's observation and replaced at the CONTRACTOR's expense.
- 12.4.2 If the Contracting Officer considers it necessary or advisable that covered Work be observed inspected or tested, the CONTRACTOR, at the Contracting Officer's request, shall uncover, expose or otherwise make available for observation, inspection or testing as the Contracting Officer may require, that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is Defective, the CONTRACTOR shall bear all direct, indirect and consequential costs of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) and the AUTHORITY shall be entitled to an appropriate decrease in the Contract Price. If, however, such Work is not found to be Defective, the CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction.

#### **12.5 DEPARTMENT May Stop the Work:**

If the Work is Defective, or the CONTRACTOR fails to supply suitable materials or equipment, or fails to furnish or perform the Work in such a way that the completed Work will conform to the Contract Documents, the Contracting Officer may order the CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the Contracting Officer to stop the Work shall not give rise to any duty on the part of the Contracting Officer to exercise this right for the benefit of the CONTRACTOR or any other party.

#### **12.6 Correction or Removal of Defective Work:**

If required by the Contracting Officer, the CONTRACTOR shall promptly, as directed, either correct all Defective Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by the Contracting Officer, remove it from the site and replace it with Work which conforms to the

requirements of the Contract Documents. The CONTRACTOR shall bear all direct, indirect and consequential costs of such correction or removal (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) made necessary thereby.

#### **12.7 One Year Correction Period:**

If within one year after the date of Substantial Completion of the relevant portion of the work or such longer period of time as may be prescribed by Regulatory Requirements or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work is found to be Defective, the CONTRACTOR shall promptly, without cost to the AUTHORITY and in accordance with the Contracting Officer's written instructions, either correct such Defective Work, or, if it has been rejected by the Contracting Officer, remove it from the site and replace it with conforming Work. If the CONTRACTOR does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, the AUTHORITY may have the Defective Work corrected or the rejected Work removed and replaced, and all direct, indirect and consequential costs of such removal and replacement (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) will be paid by the CONTRACTOR. In special circumstances where a particular item of equipment is placed in continuous service for the benefit of the AUTHORITY before Substantial Completion of all the Work, the correction period for that item may begin on an earlier date if so provided in the Specifications or by Change Order. Provisions of this paragraph are not intended to shorten the statute of limitations for bringing an action.

#### **12.8 Acceptance of Defective Work:**

Instead of requiring correction or removal and replacement of Defective Work, the Contracting Officer may accept Defective Work, the CONTRACTOR shall bear all direct, indirect and consequential costs attributable to the Contracting Office's evaluation of and determination to accept such Defective Work (costs to include but not be limited to fees and charges of engineers, architects, attorneys and other professionals). If any such acceptance occurs prior to final payment, a Change Order may be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and the AUTHORITY shall be entitled to an appropriate decrease in the Contract Price. If the AUTHORITY has already made final payment to the CONTRACTOR, an appropriate amount shall be paid by the CONTRACTOR or their Surety to the AUTHORITY.

#### **12.9 DEPARTMENT May Correct Defective Work:**

If the CONTRACTOR fails within a reasonable time after written notice from the Contracting Officer to proceed to correct Defective Work or to remove and replace rejected Work as required by the Contracting Officer in accordance with paragraph 12.6, or if the CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if the CONTRACTOR fails to comply with any other provision of the Contract Documents, the AUTHORITY may, after 7 days' written notice to the CONTRACTOR, correct and remedy any such deficiency. In exercising the rights and remedies under this paragraph the AUTHORITY shall proceed expeditiously. To the extent necessary to complete corrective and remedial action, the Contracting Officer may exclude the CONTRACTOR from all or part of the site, take possession of all or part of the Work, and suspend the CONTRACTOR's services related thereto, take possession of the CONTRACTOR's tools, appliances, construction equipment and machinery at the site and incorporate in the Work all materials and equipment stored at the site or approved remote storage sites or for which the AUTHORITY has paid the CONTRACTOR but which are stored elsewhere. The CONTRACTOR shall allow the Contracting Officer and their authorized representatives such access to the site as may be necessary to enable the Contracting Officer to exercise the rights and remedies under this paragraph. All direct, indirect and consequential costs of the AUTHORITY in exercising such rights and remedies will be charged against the CONTRACTOR, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and the AUTHORITY shall be entitled to an appropriate decrease in the Contract Price. Such direct, indirect and consequential costs will include but not be limited to fees and charges of engineers, architects, attorneys and other professionals, all court and arbitration costs and all costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of the CONTRACTOR's Defective Work. The

CONTRACTOR shall not be allowed an extension of time because of any delay in performance of the work attributable to the exercise, by the Contracting Officer, of the AUTHORITY's rights and remedies hereunder.

## **ARTICLE 13 - PAYMENTS TO CONTRACTOR AND COMPLETION**

### **13.1 Schedule of Values:**

The Schedule of Values established as provided in paragraph 6.6 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to the Contracting Officer. Progress payments on account of Unit Price Work will be based on the number of units completed.

### **13.2 Preliminary Payments:**

Upon approval of the Schedule of Values the CONTRACTOR may be paid for direct costs substantiated by paid invoices and other prerequisite documents required by the General Requirements. Direct costs shall include the cost of bonds, insurance, approved materials stored on the site or at approved remote storage sites, deposits required by a Supplier prior to fabricating materials, and other approved direct mobilization costs substantiated as indicated above. These payments shall be included as a part of the total Contract Price as stated in the Contract.

### **13.3 Application for Progress Payment:**

The CONTRACTOR shall submit to the Contracting Officer for review an Application for Payment filled out and signed by the CONTRACTOR covering the Work completed as of the date of the Application for Payment and accompanied by such supporting documentation as is required by the Contract Documents. Progress payments will be made as the Work progresses on a monthly basis.

### **13.4 Review of Applications for Progress Payment:**

Contracting Officer will either indicate in writing a recommendation of payment or return the Application for Payment to the CONTRACTOR indicating in writing the Contracting Officer's reasons for refusing to recommend payment. In the latter case, the CONTRACTOR may make the necessary corrections and resubmit the Application for Payment.

### **13.5 Stored Materials and Equipment:**

If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, paid invoice or other documentation warranting that the AUTHORITY has received the materials and equipment free and clear of all charges, security interests and encumbrances and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect the AUTHORITY's interest therein, all of which will be satisfactory to the Contracting Officer. No payment will be made for perishable materials that could be rendered useless because of long storage periods. No progress payment will be made for living plant materials until planted.

### **13.6 CONTRACTOR's Warranty of Title:**

The CONTRACTOR warrants and guarantees that title to all Work, materials and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to the AUTHORITY no later than the time of payment free and clear of any claims, liens, security interests and further obligations.

### **13.7 Withholding of Payments:**

The AUTHORITY may withhold or refuse payment for any of the reasons listed below provided it

gives written notice of its intent to withhold and of the basis for withholding:

- 13.7.1 The Work is Defective, or completed Work has been damaged requiring correction or replacement, or has been installed without Approval of Shop Drawings, or by an unapproved Subcontractor, or for unsuitable storage of materials and equipment.
- 13.7.2 The Contract Price has been reduced by Change Order,
- 13.7.3 The AUTHORITY has been required to correct Defective Work or complete Work in accordance with paragraph I2.9.
- 13.7.4 The AUTHORITY's actual knowledge of the occurrence of any of the events enumerated in paragraphs I4.2.1.a through I4.2.1.k inclusive.
- 13.7.5 Claims have been made against the AUTHORITY or against the funds held by the AUTHORITY on account of the CONTRACTOR's actions or inactions in performing this Contract, or there are other items entitling the AUTHORITY to a set off.
- 13.7.6 Subsequently discovered evidence or the results of subsequent inspections or test, nullify any previous payments for reasons stated in subparagraphs 13.7.1 through 13.7.5.
- 13.7.7 The CONTRACTOR has failed to fulfill or is in violation of any of their obligations under any provision of this Contract.

### **13.8 Retainage:**

At any time the AUTHORITY finds that satisfactory progress is not being made it may in addition to the amounts withheld under 13.7 retain a maximum amount equal to 10% of the total amount earned on all subsequent progress payments. This retainage may be released at such time as the Contracting Officer finds that satisfactory progress is being made.

### **13.9 Request for Release of Funds:**

If the CONTRACTOR believes the basis for withholding is invalid or no longer exists, immediate written notice of the facts and Contract provisions on which the CONTRACTOR relies, shall be given to the AUTHORITY, together with a request for release of funds and adequate documentary evidence proving that the problem has been cured. In the case of withholding which has occurred at the request of the AUTHORITY of Labor, the CONTRACTOR shall provide a letter from the AUTHORITY of Labor stating that withholding is no longer requested. Following such a submittal by the CONTRACTOR, the AUTHORITY shall have a reasonable time to investigate and verify the facts and seek additional assurances before determining whether release of withheld payments is justified.

### **13.10 Substantial Completion:**

When the CONTRACTOR considers the Work ready for its intended use the CONTRACTOR shall notify the Contracting Officer in writing that the Work or a portion of Work which has been specifically identified in the Contract Documents is substantially complete (except for items specifically listed by the CONTRACTOR as incomplete) and request that the AUTHORITY issue a certificate of Substantial Completion. Within a reasonable time thereafter, the Contracting Officer, the CONTRACTOR and appropriate Consultant(s) shall make an inspection of the Work to determine the status of completion.

If the Contracting Officer does not consider the Work substantially complete, the Contracting Officer will notify the CONTRACTOR in writing giving the reasons therefor. If the Contracting Officer considers the Work substantially complete, the Contracting Officer will within fourteen days execute and deliver to the CONTRACTOR a certificate of Substantial Completion with tentative list of items to be completed or corrected. At the time of delivery of the certificate of Substantial Completion the Contracting Officer will deliver to the CONTRACTOR a written division of responsibilities pending Final Completion with respect to security, operation, safety, maintenance, heat, utilities, insurance and warranties which shall be consistent with the terms of the Contract Documents.

The AUTHORITY shall be responsible for all DEPARTMENT costs resulting from the initial inspection and the first re-inspection, the CONTRACTOR shall pay all costs incurred by the AUTHORITY resulting from re-inspections, thereafter.

**13.11 Access Following Substantial Completion:**

The AUTHORITY shall have the right to exclude the CONTRACTOR from the Work after the date of Substantial Completion, but the AUTHORITY shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

**13.12 Final Inspection:**

Upon written notice from the CONTRACTOR that the entire Work or an agreed portion thereof is complete, the Contracting Officer will make a final inspection with the CONTRACTOR and appropriate Consultant(s) and will notify the CONTRACTOR in writing of all particulars in which this inspection reveals that the Work is incomplete or Defective. The CONTRACTOR shall immediately take such measures as are necessary to remedy such deficiencies. The CONTRACTOR shall pay for all costs incurred by the AUTHORITY resulting from re-inspections.

**13.13 Final Completion and Application for Payment:**

After the CONTRACTOR has completed all such corrections to the satisfaction of the Contracting Officer and delivered all schedules, guarantees, bonds, certificates of payment to all laborers, Subcontractors and Suppliers, and other documents - all as required by the Contract Documents; and after the Contracting Officer has indicated in writing that the Work has met the requirements for Final Completion, and subject to the provisions of paragraph 13.18, the CONTRACTOR may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by all remaining certificates, warranties, guarantees, releases, affidavits, and other documentation required by the Contract Documents.

**13.14 Final Payment:**

13.14.1 If on the basis of the Contracting Officer's observation of the Work during construction and final inspection, and the Contracting Officer's review of the final Application for Payment and accompanying documentation - all as required by the Contract Documents; and the Contracting Officer is satisfied that the Work has been completed and the CONTRACTOR's other obligations under the Contract Documents have been fulfilled, the AUTHORITY will process final Application for Payment. Otherwise, the Contracting Officer will return the Application for Payment to the CONTRACTOR, indicating in writing the reasons for refusing to process final payment, in which case the CONTRACTOR shall make the necessary corrections and resubmit the final Application for Payment.

13.14.2 If, through no fault of the CONTRACTOR, Final Completion of the Work is significantly delayed, the Contracting Officer shall, upon receipt of the CONTRACTOR's final Application for Payment, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by the AUTHORITY for Work not fully completed or corrected is less than the retainage provided for in paragraph 13.9, and if bonds have been furnished as required in paragraph 5.I, the written consent of the Surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the CONTRACTOR to the AUTHORITY with the application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

**13.15 Final Acceptance:**

Following certification of payment of payroll and revenue taxes, and final payment to the CONTRACTOR, the AUTHORITY will issue a letter of Final Acceptance, releasing the CONTRACTOR from further obligations under the Contract, except as provided in paragraph 13.17.

### **13.16 CONTRACTOR's Continuing Obligation:**

The CONTRACTOR's obligation to perform and complete the Work and pay all laborers, Subcontractors, and material-men in accordance with the Contract Documents shall be absolute. Neither any progress or final payment by the AUTHORITY, nor the issuance of a certificate of Substantial Completion, nor any use or occupancy of the Work or any part thereof by the AUTHORITY or Using Agency, nor any act of acceptance by the AUTHORITY nor any failure to do so, nor any review and Approval of a Shop Drawing or sample submission, nor any correction of Defective Work by the AUTHORITY will constitute an acceptance of Work not in accordance with the Contract Documents or a release of the CONTRACTOR's obligation to perform the Work in accordance with the Contract Documents.

When it is anticipated that restarting, testing, adjusting, or balancing of systems will be required following Final Acceptance and said requirements are noted in Section(s) 01650, such Work shall constitute a continuing obligation under the Contract.

### **13.17 Waiver of Claims by CONTRACTOR:**

The making and acceptance of final payment will constitute a waiver of all claims by the CONTRACTOR against the AUTHORITY other than those previously made in writing and still unsettled.

### **13.18 No Waiver of Legal Rights:**

The AUTHORITY shall not be precluded or be estopped by any payment, measurement, estimate, or certificate made either before or after the completion and acceptance of the Work and payment therefor, from showing the true amount and character of the Work performed and materials furnished by the CONTRACTOR, nor from showing that any payment, measurement, estimate or certificate is untrue or is incorrectly made, or that the Work or materials are Defective. The AUTHORITY shall not be precluded or estopped, notwithstanding any such measurement, estimate, or certificate and payment in accordance therewith, from recovering from the CONTRACTOR or their Sureties, or both, such damages as it may sustain by reason of their failure to comply with requirements of the Contract Documents. Neither the acceptance by the AUTHORITY, or any representative of the AUTHORITY, nor any payment for or acceptance of the whole or any part of the Work, nor any extension of the Contract Time, nor any possession taken by the AUTHORITY, shall operate as a waiver of any portion of the Contract or of any power herein reserved, or of any right to damages. A waiver by the AUTHORITY of any breach of the Contract shall not be held to be a waiver of any other subsequent breach.

## **ARTICLE 14 - SUSPENSION OF WORK, DEFAULT AND TERMINATION**

### **14.1 DEPARTMENT May Suspend Work:**

14.1.1 The AUTHORITY may, at any time, suspend the Work or any portion thereof by notice in writing to the CONTRACTOR. If the Work is suspended without cause the CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension if the CONTRACTOR makes an Approved claim therefor as provided in Article 15. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent that suspension is due to the fault or negligence of the CONTRACTOR, or that suspension is necessary for Contract compliance, or that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the CONTRACTOR.

14.1.2 In case of suspension of Work, the CONTRACTOR shall be responsible for preventing damage to or loss of any of the Work already performed and of all materials whether stored on or off the site or Approved remote storage sites.

### **14.2 Default of Contract:**

14.2.1 The Contracting Officer may give the CONTRACTOR and its surety a written Notice to Cure

Default if the CONTRACTOR:

- a. fails to begin work in the time specified,
- b. fails to use sufficient resources to assure prompt completion of the work,
- c. performs the work unsuitably or neglects or refuses to remove and replace rejected materials or work,
- d. stops work,
- e. fails to resume stopped work after receiving notice to do so,
- f. becomes insolvent (except that if the CONTRACTOR declares bankruptcy, termination will be under Title 11 US Code 362 and/or 365. The CONTRACTOR'S bankruptcy does not relieve the surety of any obligations to assume the Contract and complete the work in a timely manner.
- g. Allows any final judgment to stand against him unsatisfied for period of 60 days, or
- h. Makes an assignment for the benefit of creditors without the consent of the Contracting Officer, or
- i. Disregards Regulatory Requirements of any public body having jurisdiction, or
- j. Otherwise violates in any substantial way any provisions of the Contract Documents, or
- k. fails to comply with Contract minimum wage payments or civil rights requirements, or
- l. is a party to fraud, deception, misrepresentation , or
- m. for any cause whatsoever, fails to carry on the Work in an acceptable manner.

14.2.2 The Notice to Cure Default will detail the conditions determined to be in default, the time within which to cure the default and may, in the Contracting Officer's discretion, specify the actions necessary to cure the default. Failure to cure the delay, neglect or default within the time specified in the Contracting Officer's written notice to cure authorizes the AUTHORITY to terminate the contract. The Contracting Officer may allow more time to cure than originally stated in the Notice to Cure Default if he deems it to be in the best interests of the AUTHORITY. The AUTHORITY will provide the CONTRACTOR or its surety with a written Notice of Default Termination that details the default and the failure to cure it.

14.2.3 If the CONTRACTOR or its Surety, within the time specified in the above notice of default, shall not proceed in accordance therewith, then the AUTHORITY may, upon written notification from the Contracting Officer of the fact of such delay, neglect or default and the CONTRACTOR's failure to comply with such notice, have full power and authority without violating the Contract, to take the prosecution of the Work out of the hands of the CONTRACTOR. The AUTHORITY may terminate the services of the CONTRACTOR, exclude the CONTRACTOR from the site and take possession of the Work and of all the CONTRACTOR's tools, appliances, construction equipment and machinery at the site and use the same to the full extent they could be used by the CONTRACTOR (without liability to the CONTRACTOR for trespass or conversion), incorporate in the Work all materials and equipment stored at the site or for which the AUTHORITY has paid the CONTRACTOR but which are stored elsewhere, and finish the Work as the AUTHORITY may deem expedient. The AUTHORITY may enter into an agreement for the completion of said Contract according to the terms and provisions thereof, or use such other methods that in the opinion of the Contracting Officer are required for the completion of said Contract in an acceptable manner.

14.2.4 The Contracting Officer may, by written notice to the CONTRACTOR and its Surety or its representative, transfer the employment of the Work from the CONTRACTOR to the Surety, or if the CONTRACTOR abandons the Work undertaken under the Contract, the Contracting Officer may, at its option with written notice to the Surety and without any written notice to the CONTRACTOR, transfer the employment for said Work directly to the Surety. The Surety shall submit its plan for completion of the Work, including any contracts or agreements with third parties for such completion, to the AUTHORITY for approval prior to beginning completion of the

Work. Approval of such contracts shall be in accordance with all applicable requirements and procedures for approval of subcontracts as stated in the Contract Documents.

- 14.2.5 After the notice of termination is issued, the AUTHORITY may take over the work and complete it by contract or otherwise and may take possession of and use materials, appliances, equipment or plant on the work site necessary for completing the work.
- 14.2.6 Rather than taking over the work itself, the AUTHORITY may transfer the obligation to perform the work from the CONTRACTOR to its surety. The surety must submit its plan for completion of the work, including any contracts or agreements with third parties for completion, to the AUTHORITY for approval prior to beginning work. The surety must follow the Contract requirements for approval of subcontracts, except that the limitation on percent of work subcontracted will not apply.
- 14.2.7 On receipt of the transfer notice, the surety must take possession of all materials, tools, and appliances at the work site, employ an appropriate work force, and complete the Contract work, as specified. The Contract specifications and requirements shall remain in effect. However the AUTHORITY will make subsequent Contract payments directly to the Surety for work performed under the terms of the Contract. The CONTRACTOR shall forfeit any right to claim for the same work or any part thereof. The CONTRACTOR shall not be entitled to receive any further balance of the amount to be paid under the Contract.
- 14.2.8 Upon receipt of the notice terminating the services of the CONTRACTOR, the Surety shall enter upon the premises and take possession of all materials, tools, and appliances thereon for the purpose of completing the Work included under the Contract and employ by contract or otherwise any person or persons to finish the Work and provide the materials therefore, without termination of the continuing full force and effect of this Contract. In case of such transfer of employment to the Surety, the Surety shall be paid in its own name on estimates covering Work subsequently performed under the terms of the Contract and according to the terms thereof without any right of the CONTRACTOR to make any claim for the same or any part thereof.
- 14.2.9 If the Contract is terminated for default, the CONTRACTOR and the Surety shall be jointly and severally liable for damages for delay as provided by paragraph 11.8, and for the excess cost of completion, and all costs and expenses incurred by the AUTHORITY in completing the Work or arranging for completion of the Work, including but not limited to costs of assessing the Work to be done, costs associated with advertising, soliciting or negotiating for bids or proposals for completion, and other re-procurement costs. Following termination the CONTRACTOR shall not be entitled to receive any further balance of the amount to be paid under the Contract until the Work is fully finished and accepted, at which time if the unpaid balance exceeds the amount due the AUTHORITY and any amounts due to persons for whose benefit the AUTHORITY has withheld funds, such excess shall be paid by the AUTHORITY to the CONTRACTOR. If the damages, costs, and expenses due the AUTHORITY exceed the unpaid balance, the CONTRACTOR and its Surety shall pay the difference.
- 14.2.10 If, after notice of termination of the CONTRACTOR's right to proceed under the provisions of this clause, it is determined for any reason that the CONTRACTOR was not in default under the provisions of this clause, or that the delay was excusable under the provisions of this clause, or that termination was wrongful, the rights and obligations of the parties shall be determined in accordance with the clause providing for convenience termination.

#### **14.3 Rights or Remedies:**

Where the CONTRACTOR's services have been so terminated by the AUTHORITY, the termination will not affect any rights or remedies of the AUTHORITY against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due the CONTRACTOR by the AUTHORITY will not release the CONTRACTOR from liability.

#### **14.4 Convenience Termination:**

- 14.4.1 The performance of the Work may be terminated by the AUTHORITY in accordance with this section in whole or in part, whenever, for any reason the Contracting Officer shall determine that such termination is in the best interest of the AUTHORITY. Any such termination shall be effected by delivery to the CONTRACTOR of a Notice of Termination, specifying termination is for



the convenience of the AUTHORITY the extent to which performance of Work is terminated, and the date upon which such termination becomes effective.

14.4.2 Immediately upon receipt of a Notice of Termination and except as otherwise directed by the Contracting Officer, the CONTRACTOR shall:

- a. Stop Work on the date and to the extent specified in the Notice of Termination;
- b. Place no further orders or subcontracts for materials, services, or facilities except as may be necessary for completion of such portion of the Work as is not terminated;
- c. Terminate all orders and subcontracts to the extent that they relate to the performance of Work terminated by the Notice of Termination;
- d. With the written Approval of the Contracting Officer, to the extent they may require, settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, the cost of which would be reimbursable, in whole, or in part, in accordance with the provisions of the Contract;
- e. Submit to the Contracting Officer a list, certified as to quantity and quality, of any or all items of termination inventory exclusive of items the disposition of which had been directed or authorized by the Contracting Officer;
- f. Transfer to the Contracting Officer the completed or partially completed record drawings, Shop Drawings, information, and other property which, if the Contract had been completed, would be required to be furnished to the AUTHORITY;
- g. Take such action as may be necessary, or as the Contracting Officer may direct, for the protection and preservation of the property related to the Contract which is in the possession of the CONTRACTOR and in which the AUTHORITY has or may acquire any interest.

The CONTRACTOR shall proceed immediately with the performance of the above obligations.

14.4.3 When the AUTHORITY orders termination of the Work effective on a certain date, all Work in place as of that date will be paid for in accordance with Article 13 of the Contract. Materials required for completion and on hand but not incorporated in the Work will be paid for at invoice cost plus 15% with materials becoming the property of the AUTHORITY - or the CONTRACTOR may retain title to the materials and be paid an agreed upon lump sum. Materials on order shall be cancelled, and the AUTHORITY shall pay reasonable factory cancellation charges with the option of taking delivery of the materials in lieu of payment of cancellation charges. The CONTRACTOR shall be paid 10% of the cost, freight not included, of materials cancelled, and direct expenses only for CONTRACTOR chartered freight transport which cannot be cancelled without charges, to the extent that the CONTRACTOR can establish them. The extra costs due to cancellation of bonds and insurance and that part of job start-up and phase-out costs not amortized by the amount of Work accomplished shall be paid by the AUTHORITY. Charges for loss of profit or consequential damages shall not be recoverable except as provided above.

- a. The following costs are not payable under a termination settlement agreement or Contracting Officer's determination of the termination claim:
  1. Loss of anticipated profits or consequential or compensatory damages
  2. Unabsorbed home office overhead (also termed "General & Administrative Expense") related to ongoing business operations
  3. Bidding and project investigative costs
  4. Direct costs of repairing equipment to render it operable for use on the terminated work

14.4.4 The termination claim shall be submitted promptly, but in no event later than 90 days from the effective date of termination, unless extensions in writing are granted by the Contracting Officer upon written request of the CONTRACTOR made within the 90-day period. Upon failure of the CONTRACTOR to submit their termination claim within the time allowed, the Contracting Officer may determine, on the basis of information available to him, the amount, if any, due to the

CONTRACTOR by reason of the termination and shall thereupon pay to the CONTRACTOR the amount so determined.

- 14.4.5 The CONTRACTOR and the Contracting Officer may agree upon whole or any part of the amount or amounts to be paid to the CONTRACTOR by reason of the total or partial termination of Work pursuant to this section. The Contract shall be amended accordingly, and the CONTRACTOR shall be paid the agreed amount.
- 14.4.6 In the event of the failure of the CONTRACTOR and the Contracting Officer to agree in whole or in part, as provided heretofore, as to the amounts with respect to costs to be paid to the CONTRACTOR in connection with the termination of the Work the Contracting Officer shall determine, on the basis of information available to him, the amount, if any, due to the CONTRACTOR by reason of the termination and shall pay to the CONTRACTOR the amount determined as follows:
- a. All costs and expenses reimbursable in accordance with the Contract not previously paid to the CONTRACTOR for the performance of the Work prior to the effective date of the Notice of Termination;
  - b. So far as not included under "a" above, the cost of settling and paying claims arising out of the termination of the Work under subcontracts or orders which are properly chargeable to the terminated portions of the Contract;
  - c. So far as practicable, claims by the CONTRACTOR for idled or stand-by equipment shall be made as follows: Equipment claims will be reimbursed as follows:
    1. Contractor-owned equipment usage, based on the CONTRACTOR'S ownership and operating costs for each piece of equipment as determined from the CONTRACTOR'S accounting records. Under no circumstance, may the CONTRACTOR base equipment claims on published rental rates.
    2. Idle or stand-by time for Contractor-owned equipment, based on the CONTRACTOR'S internal ownership and depreciation costs. Idle or stand-by equipment time is limited to the actual period of time equipment is idle or on stand-by as a direct result of the termination, not to exceed 30 days. Operating expenses will not be included for payment of idle or stand-by equipment time.
    3. Rented equipment, based on reasonable, actual rental costs. Equipment leased under "capital leases" as defined in Financial Accounting Standard No. 13 will be considered Contractor-owned equipment. Equipment leased from an affiliate, division, subsidiary or other organization under common control with the CONTRACTOR will be considered Contractor-owned equipment, unless the lessor has an established record of leasing to unaffiliated lessees at competitive rates consistent with the rates the CONTRACTOR has agreed to pay and no more than forty percent of the lessor's leasing business, measured in dollars, is with organizations affiliated with the lessor.
- 14.4.7 The CONTRACTOR shall have the right of appeal under the AUTHORITY's claim procedures, as defined in Article 15, for any determination made by the Contracting Officer, except if the CONTRACTOR has failed to submit their claim within the time provided and has failed to request extension of such time, CONTRACTOR shall have no such right of appeal. In arriving at the amount due the CONTRACTOR under this section, there shall be deducted:
- a. All previous payments made to the CONTRACTOR for the performance of Work under the Contract prior to termination;
  - b. Any claim for which the AUTHORITY may have against the CONTRACTOR;
  - c. The agreed price for, or the proceeds of sale of, any materials, supplies, or other things acquired by the CONTRACTOR or sold pursuant to the provisions of this section and not otherwise recovered by or credited to the AUTHORITY; and,
  - d. All progress payments made to the CONTRACTOR under the provisions of this section.
- 14.4.8 Where the Work has been terminated by the AUTHORITY said termination shall not affect or terminate any of the rights of the AUTHORITY against the CONTRACTOR or their Surety then

existing or which may thereafter accrue because of such default. Any retention or payment of monies by the AUTHORITY due to the CONTRACTOR under the terms of the Contract shall not release the CONTRACTOR or its Surety from liability.

- 14.4.9 The CONTRACTOR's termination claim may not include claims that pre dated the notice for termination for convenience. Those claims shall be prosecuted by the CONTRACTOR under Article 15.
- 14.4.10 The CONTRACTOR'S termination claim may not exceed the total dollar value of the contract as awarded plus agreed upon change orders less the amounts that have been paid for work completed.
- a. Unless otherwise provided for in the Contract Documents, or by applicable statute, the CONTRACTOR, from the effective date of termination and for a period of three years after final settlement under this Contract, shall preserve and make available to the AUTHORITY at all reasonable times at the office of the CONTRACTOR, all its books, records, documents, and other evidence bearing on the cost and expenses of the CONTRACTOR under their Contract and relating to the Work terminated hereunder.
  - b. Definitions. In this Subsection 108-1.09, the term "cost" and the term "expense" mean a monetary amount in U.S. Dollars actually incurred by the CONTRACTOR, actually reflected in its contemporaneously maintained accounting or other financial records and supported by original source documentation.
  - c. Cost Principles. The AUTHORITY may use the federal cost principles at 48 CFR §§ 31.201-1 to 31.205-52 (or succeeding cost principles for fixed price contracts) as guidelines in determining allowable costs under this Subsection to the extent they are applicable to construction contracts and consistent with the specifications of this Contract. The provisions of this contract control where they are more restrictive than, or inconsistent with, these federal cost principles."

## **ARTICLE 15 - CLAIMS FOR ADJUSTMENT AND DISPUTES**

### **15.1 Notification**

- 15.1.1 The CONTRACTOR shall notify the AUTHORITY in writing as soon as the CONTRACTOR becomes aware of any act or occurrence, which may form the basis of a claim for additional compensation or an extension of Contract Time or of any dispute regarding a question of fact or interpretation of the Contract. The AUTHORITY has no obligation to investigate any fact or occurrence that might form the basis of a claim or to provide any additional compensation or extension of Contract Time unless the CONTRACTOR has notified the AUTHORITY in writing in a timely manner of all facts the CONTRACTOR believes form the basis for the claim.
- 15.1.2 If the CONTRACTOR believes that he is entitled to an extension of Contract Time, then the CONTRACTOR must state the contract section on which Contractor based their extension request, provide the AUTHORITY with sufficient information to demonstrate that the CONTRACTOR has suffered excusable delay, and show the specific amount of time to which the CONTRACTOR is entitled. The AUTHORITY will not grant an extension of Contract Time if the CONTRACTOR does not timely submit revised schedules under **Section 01310**.
- 15.1.3 If the matter is not resolved by agreement within 7 days, the CONTRACTOR shall submit Intent to Claim, in writing, to the AUTHORITY within the next 14 days.
- 15.1.4 If the CONTRACTOR believes additional compensation or time is warranted, then he must immediately begin keeping complete, accurate, and specific daily records concerning every detail of the potential claim including actual costs incurred. The CONTRACTOR shall provide the AUTHORITY access to any such records and furnish the AUTHORITY copies, if requested. Equipment costs must be based on the CONTRACTOR's internal rates for ownership, depreciation, and operating expenses and not on published rental rates. In computing damages, or costs claimed for a change order, or for any other claim against the AUTHORITY for additional time, compensation or both, the CONTRACTOR must prove actual damages based on internal

costs for equipment, labor or efficiencies. Total cost, modified total cost or jury verdict forms of presentation of damage claims are not permissible to show damages. Labor inefficiencies must be shown to actually have occurred and can be proven solely based on job records. Theoretical studies are not a permissible means of showing labor inefficiencies. Home office overhead will not be allowed as a component of any claim against the AUTHORITY.

- 15.1.5 If the claim or dispute is not resolved by the AUTHORITY, then the CONTRACTOR shall submit a written Claim to the Contracting Officer within 90 days after the CONTRACTOR becomes aware of the basis of the claim or should have known the basis of the claim, whichever is earlier. The Contracting Officer will issue written acknowledgment of the receipt of the Claim.
- 15.1.6 The CONTRACTOR waives any right to claim if the AUTHORITY was not notified properly or afforded the opportunity to inspect conditions or monitor actual costs, or if the Claim is not filed on the date required.

## **15.2 Presenting the Claim**

- 15.2.1 The Claim must include all of the following:
  - a. The act, event, or condition the claim is based on
  - b. The Contract provisions which apply to the claim and provide relief
  - c. The item or items of Contract work affected and how they are affected
  - d. The specific relief requested, including Contract Time if applicable, and the basis upon which it was calculated
  - e. A statement certifying that the claim is made in good faith, that the supporting cost and pricing data are accurate and complete to the best of your knowledge and belief, and that the amount requested accurately reflects the Contract adjustment which the CONTRACTOR believes is due.

## **15.3 Claim Validity, Additional Information, and DEPARTMENT's Action**

- 15.3.1 The Claim, in order to be valid, must not only show that the CONTRACTOR suffered damages or delay but that it was caused by the act, event, or condition complained of and that the Contract provides entitlement to relief for such act, event, or condition.
- 15.3.2 The AUTHORITY can make written request to the CONTRACTOR at any time for additional information relative to the Claim. The CONTRACTOR shall provide the AUTHORITY the additional information within 30 days of receipt of such a request. Failure to furnish the additional information may be regarded as a waiver of the Claim.

## **15.4 Contracting Officer's Decision**

The CONTRACTOR will be furnished the Contracting Officer's Decision within 90 days, unless the Contracting Officer requests additional information or gives the CONTRACTOR notice that the time for issuing a decision is being extended for a specified period under AS 36.30.620. The Contracting Officer's decision is final and conclusive unless, within 14 days of receipt of the decision, the CONTRACTOR delivers a Notice of Appeal to the AIDEA Chief Procurement Officer. Procedures for appeals are covered under AS 36.30.625 and AS 36.30.630.

## **15.5 Fraud and Misrepresentation in Making Claims**

Criminal and Civil penalties authorized under AS 36.30.687 (including, but not limited to, forfeiture of all claimed amounts) may be imposed on the CONTRACTOR if the CONTRACTOR makes or uses a misrepresentation in support of a claim or defraud or attempt to defraud the AUTHORITY at any stage of prosecuting a claim under this Contract.



STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

**REQUIRED CONTRACT PROVISIONS**  
**for**  
**FEDERAL-AID (FAA) CONSTRUCTION CONTRACTS**

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**I. GENERAL**

Procurements made under the Airport Improvement Program, AIP, must adhere to the provisions outlined in Title 49 CFR Part 18.36. This regulation provides for policies and procedures to be applied to typical procurement actions under the AIP, such as construction development, equipment purchases, and selection for professional services (engineering consultants etc.)

The Federal Aviation Administration, FAA, is not a party to the contracts, the Alaska Department of Transportation and Public Facilities, DOT&PF, executes in support of the AIP. The DOT&PF is the contractual authority for establishing and administering the contract agreements and is responsible for all contractual matters, including evaluation and award of contract, resolution of claims and disputes, and settlement of litigation issues.

A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the DOT&PF and FAA.

**II. CIVIL RIGHTS ACT OF 1964, TITLE VI**

(Required in all contracts and subcontracts)

During the performance of this contract, the contractor, for itself, its assignees and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

**1.1 Compliance with Regulations.** The contractor shall comply with the Regulations relative to nondiscrimination in federally assisted programs of the Department of Transportation (hereinafter, "DOT") Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this contract.

**1.2 Nondiscrimination.** The contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor shall not participate either directly or indirectly in the discrimination prohibited by section 21.5 of the Regulations, including employment practices when the contract covers a program set forth in Appendix B of the Regulations.

**1.3 Solicitations for Subcontracts, Including Procurements of Materials and Equipment.** In all solicitations either by competitive bidding or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color, or national origin.

**1.4 Information and Reports.** The contractor shall provide all information and reports required by the Regulations or directives issued pursuant thereto and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the DOT&PF or the FAA to be pertinent to ascertain compliance with such Regulations, orders, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information, the contractor shall so certify to the DOT&PF or the FAA, as appropriate,

and shall set forth what efforts it has made to obtain the information.

**1.5 Sanctions for Noncompliance.** In the event of the contractor's noncompliance with the nondiscrimination provisions of this contract, the sponsor shall impose such contract sanctions as it or the FAA may determine to be appropriate, including, but not limited to:

- a. Withholding of payments to the contractor under the contract until the contractor complies, and/or
- b. Cancellation, termination, or suspension of the contract, in whole or in part.

**1.6 Incorporation of Provisions.** The contractor shall include the provisions of paragraphs 1 through 5 in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations or directives issued pursuant thereto. The contractor shall take such action with respect to any subcontract or procurement as the DOT&PF or the FAA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the contractor may request the DOT&PF to enter into such litigation to protect the interests of the DOT&PF and, in addition, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

**1.7 Airport and Airway Improvement Act of 1982.** The contractor assures that it will comply with pertinent statutes, Executive orders and such rules as are promulgated to assure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or handicap be excluded from participating in any activity conducted with or benefiting from Federal assistance. This provision obligates the tenant/concessionaire/lessee or its transferee for the period during which Federal assistance is extended to the airport a program, except where Federal assistance is to provide, or is in the form of personal property or real property or interest therein or structures or improvements thereon. In these cases the provision obligates the party or any transferee for the longer of the following periods: (a) the period during which the property is used by the DOT&PF or any transferee for a purpose for which Federal assistance is extended, or for another purpose involving the provision of similar services or benefits or (b) the period during which the DOT&PF or any transferee retains ownership or possession of the property. In the case of contractors, this provision binds the contractors from the bid solicitation period through the completion of the contract. This provision is in addition to that required of Title VI of the Civil Rights Act of 1964.

### III. BUY AMERICAN PREFERENCES

(Required in all contracts and subcontracts)

In accepting AIP funding, the DOT&PF is certifying that they will not acquire (or permit any contractor or subcontractor) to use any steel or manufactured products produced outside the United States on any portion of the project for which funds are provided, unless otherwise approved by the FAA. Therefore, for the AIP funded portion of a project, contractor must either:

1. Certify, in writing, all products are wholly produced in the US of US materials, or
2. Request a waiver to use non-US produced products, or
3. Certify that all equipment that is being used on the project is on the Nationwide Buy American conformance list.

The AIP funded portion of a project includes the grant recipient's local share.

Under 49 U.S.C. § 50101(b), the FAA has the authority to waive these Buy American Preferences if certain market or product conditions exist. These are:

1. Applying the Buy American Preferences would be inconsistent with the public interest;
2. The steel or goods produced in the U.S. are not produced in a sufficient and reasonably available amount or are not of a satisfactory quality;
3. When the cost of components and subcomponents produced in the U.S. is more than 60 percent of the cost of all components of the facility or equipment procured and final assembly occurs in the United States; or
4. Including domestic material will increase the cost of the overall project by more than 25 percent.

### IV. DAVIS-BACON LABOR PROVISIONS

(Incorporate into all construction contracts and subcontracts that exceed \$2,000 and are financed under the AIP program.)

#### 1. Minimum Wages

(i) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by the Secretary of Labor under the Copeland Act (29 CFR Part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalent thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any

contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR Part 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: *Provided*, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under (1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can easily be seen by the workers.

(ii)(A) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards

Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(ii) (B) or (C) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, *Provided*, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

## **2 Withholding.**

The FAA or the DOT&PF shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of work, all or part of the wages required by the contract, the FAA may, after

written notice to the contractor, DOT&PF, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

### 3. Payrolls and basic records.

(i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual costs incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the FAA, if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant, DOT&PF, or owner, as the case may be, for transmission to the FAA. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (*e.g.*, the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and

subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the FAA, if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit them to the applicant, DOT&PF, or owner, as the case may be, for transmission to the FAA, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the DOT&PF (or the applicant, sponsor, or owner).

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under § 5.5(a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 5.5(a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(2) That each laborer and mechanic (including each helper, apprentice and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations 29 CFR Part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under paragraph (3)(i) of this section available for inspection, copying or transcription by authorized representatives of the Sponsor, the FAA or the Department of Labor, and shall permit such representatives to interview employees during working



hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the contractor, DOT&PF, applicant or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

#### 4. Apprentices and Trainees.

(i) **Apprentices.** Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator

determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) **Trainees.** Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) **Equal Employment Opportunity.** The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

#### 5. Compliance With Copeland Act Requirements.

The contractor shall comply with the requirements of 29 CFR Part 3, which are incorporated by reference in this contract.

## **6. Subcontracts.**

The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR Part 5.5(a)(1) through (10) and such other clauses as the FAA may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR Part 5.5.

## **7. Contract Termination: Debarment.**

A breach of the contract clauses in paragraph 1 through 10 of this section may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

## **8. Compliance With Davis-Bacon and Related Act Requirements.**

All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract.

## **9. Disputes Concerning Labor Standards.**

Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6 and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the DOT&PF, the U.S. Department of Labor, or the employees or their representatives.

## **10. Certification of Eligibility.**

(i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

## **V. CONTRACT WORKHOURS AND SAFETY STANDARDS ACT REQUIREMENTS, 29 CFR PART 5**

(Incorporate into all construction contracts and subcontracts that exceed \$100,000 and are financed under the AIP program.)

## **1. Overtime Requirements.**

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic, including watchmen and guards, in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

## **2. Violation; Liability for Unpaid Wages; Liquidated Damages.**

In the event of any violation of the clause set forth in paragraph (1) above, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph 1 above, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph 1 above.

## **3. Withholding for Unpaid Wages and Liquidated Damages.**

The FAA or the DOT&PF shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any monies payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 2 above.

## **4. Subcontractors.**

The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraphs 1 through 4 and also a clause requiring the subcontractor to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs 1 through 4 of this section.

## **VI. SUBLETTING OR ASSIGNING THE CONTRACT**

(Incorporate into all procurement contracts that are funded by AIP funds)

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the DOT&PF. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;

(2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor remains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products

which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the DOT&PF has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, DOT&PF may establish their own self-performance requirements.

## **VII. ACCESS TO RECORDS AND REPORTS**

(Incorporate into all procurement contracts that are funded by AIP funds)

The Contractor shall maintain an acceptable cost accounting system. The Contractor agrees to provide the DOT&PF, the FAA and the Comptroller General of the United States or any of their duly authorized representatives access to any books, documents, papers, and records of the contractor which are directly pertinent to the specific contract for the purpose of making audit, examination, excerpts and transcriptions. The Contractor agrees to maintain all books, records and reports required under this contract for a period of not less than three years after final payment is made and all pending matters are closed.

## **VIII. CERTIFICATION OF NONSEGREGATED FACILITIES**

(Incorporate in all construction contracts and subcontracts that exceed \$10,000. The notices should be placed within the solicitation for proposals. The actual certification should be incorporated in the contract agreement.)

The federally-assisted construction contractor certifies that she or he does not maintain or provide, for his employees, any segregated facilities at any of his establishments and that she or he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally-assisted construction contractor certifies that she or he will not maintain or provide, for his employees, segregated facilities at any of his establishments and that she or he will not permit his

employees to perform their services at any location under his control where segregated facilities are maintained. The federally-assisted construction contractor agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this contract.

As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms, and washrooms, restaurants and other eating areas, timeclocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directives or are, in fact, segregated on the basis of race, color, religion, or national origin because of habit, local custom, or any other reason. The federally-assisted construction contractor agrees that (except where she or he has obtained identical certifications from proposed subcontractors for specific time periods) she or he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause and that she or he will retain such certifications in his files.

#### **IX. CLEAN AIR AND WATER POLLUTION CONTROL**

(Incorporate in all contracts and subcontracts that exceed \$100,000.)

Contractors and subcontractors agree:

a. That any facility to be used in the performance of the contract or subcontract or to benefit from the contract is not listed on the Environmental Protection Agency (EPA) List of Violating Facilities;

b. To comply with all the requirements of Section 114 of the Clean Air Act, as amended, 42 U.S.C. 1857 et seq. and Section 308 of the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq. relating to inspection, monitoring, entry, reports, and information, as well as all other requirements specified in Section 114 and Section 308 of the Acts, respectively, and all other regulations and guidelines issued thereunder;

c. That, as a condition for the award of this contract, the contractor or subcontractor will notify the awarding official of the receipt of any communication from the EPA indicating that a facility to be used for the performance of or benefit from the contract is under consideration to be listed on the EPA List of Violating Facilities;

d. To include or cause to be included in any construction contract or subcontract which exceeds \$ 100,000 the aforementioned criteria and requirements.

#### **X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION**

(Incorporate into all contracts that exceed \$25,000, which funded under the AIP. Incorporate in all contracts for auditing services regardless of the contract amount.)

The bidder/offeror certifies, by submission of this proposal or acceptance of this contract, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency. It further agrees by submitting this proposal that it will include this clause without modification in all lower tier transactions, solicitations, proposals, contracts, and subcontracts. Where the bidder/offeror/contractor or any lower tier participant is unable to certify to this statement, it shall attach an explanation to this solicitation/proposal.

#### **XI. LOBBYING AND INFLUENCING FEDERAL EMPLOYEES**

(Required in all contracts and subcontracts.)

(1) No Federal appropriated funds shall be paid, by or on behalf of the contractor, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the making of any Federal grant and the amendment or modification of any Federal grant.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any Federal grant, the contractor shall complete and submit Standard Form-LLL, "Disclosure of Lobby Activities," in accordance with its instructions.

#### **XII. EQUAL EMPLOYMENT OPPORTUNITY**

(Incorporate in all construction contracts and subcontracts that exceed \$10,000.)

During the performance of this contract, the contractor agrees as follows:

1. The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in

conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

2. The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, or national origin.

3. The contractor will send to each labor union or representative of workers with which she/he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

4. The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, as amended, and of the rules, regulations, and relevant orders of the Secretary of Labor.

5. The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

6. In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedure authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

7. The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provision, including sanctions for noncompliance: *Provided, however,* that in the event a contractor

becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the contractor may request the United States to enter into such litigation to protect the interests of the United States.

### **XIII. DISADVANTAGED BUSINESS ENTERPRISES**

(The contract assurance clause shall be incorporated verbatim. The prompt payment clause represents sample language that meets the requirements of 49 CFR Part 26.29)

**Contract Assurance** - The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy, as the recipient deems appropriate.

**Prompt Payment** - The prime contractor agrees to pay each subcontractor under this prime contract for satisfactory performance of its contract no later than eight working days from the receipt of each payment the prime contractor receives from DOT&PF. The prime contractor agrees further to return retainage payments to each subcontractor within eight working days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the DOT&PF. This clause applies to both DBE and non-DBE subcontractors.

### **XIV. RIGHTS TO INVENTIONS**

(Incorporate into all procurement contracts that funded by AIP funds.)

All rights to inventions and materials generated under this contract are subject to regulations issued by the FAA and the DOT&PF under which this contract is executed.

### **XV. TRADE RESTRICTION CLAUSE**

(Incorporate into all contracts funded by AIP.)

The contractor or subcontractor, by submission of an offer and/or execution of a contract, certifies that it:

a. is not owned or controlled by one or more citizens of a foreign country included in the list of countries that discriminate against U.S. firms published by the Office of the United States Trade Representative (USTR);

b. has not knowingly entered into any contract or subcontract for this project with a person that is a citizen or national of a foreign country on said list, or is owned or controlled directly or indirectly by one or more citizens or nationals of a foreign country on said list;

c. has not procured any product nor subcontracted for the supply of any product for use on the project that is produced in a foreign country on said list.

Unless the restrictions of this clause are waived by the Secretary of Transportation in accordance with 49 CFR 30.17, no contract shall be awarded to a contractor or subcontractor who is unable to certify to the above. If the contractor knowingly procures or subcontracts for the supply of any product or service of a foreign country on said list for use on the project, the Federal Aviation Administration may direct through the Sponsor cancellation of the contract at no cost to the Government.

Further, the contractor agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification without modification in each contract and in all lower tier subcontracts. The contractor may rely on the certification of a prospective subcontractor unless it has knowledge that the certification is erroneous.

The contractor shall provide immediate written notice to the sponsor if the contractor learns that its certification or that of a subcontractor was erroneous when submitted or has become erroneous by reason of changed circumstances. The subcontractor agrees to provide written notice to the contractor if at any time it learns that its certification was erroneous by reason of changed circumstances.

This certification is a material representation of fact upon which reliance was placed when making the award. If it is later determined that the contractor or subcontractor knowingly rendered an erroneous certification, the FAA may direct through the DOT&PF cancellation of the contract or subcontract for default at no cost to the Government.

Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by this provision. The knowledge and information of a contractor is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

This certification concerns a matter within the jurisdiction of an agency of the United States of America and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code, Section 1001.

#### **XVI. VETERAN'S PREFERENCE**

(Incorporate into all construction contracts financed under the AIP program.)

In the employment of labor (except in executive, administrative, and supervisory positions), preference shall be given to Veterans of the Vietnam era and disabled veterans as defined in Section 515(c)(1) and (2) of the Airport and Airway Improvement Act of 1982. However, this preference shall apply only where the individuals are available and qualified to perform the work to which the employment relates.

#### **XVII. TERMINATION OF CONTRACT**

(Incorporate into all procurement contracts that funded by AIP funds that exceed \$10,000.)

a. The DOT&PF may, by written notice, terminate this contract in whole or in part at any time, either for the DOT&PF's convenience or because of failure to fulfill the contract obligations. Upon receipt of such notice services shall be immediately discontinued (unless the notice directs otherwise) and all materials as may have been accumulated in performing this contract, whether completed or in progress, delivered to the DOT&PF.

b. If the termination is for the convenience of the DOT&PF, an equitable adjustment in the contract price shall be made, but no amount shall be allowed for anticipated profit on unperformed services.

c. If the termination is due to failure to fulfill the contractor's obligations, the DOT&PF may take over the work and prosecute the same to completion by contract or otherwise. In such case, the contractor shall be liable to the DOT&PF for any additional cost occasioned to the DOT&PF thereby.

d. If, after notice of termination for failure to fulfill contract obligations, it is determined that the contractor had not so failed, the termination shall be deemed to have been effected for the convenience of the DOT&PF. In such event, adjustment in the contract price shall be made as provided in paragraph 2 of this clause.

e. The rights and remedies of the DOT&PF provided in this clause are in addition to any other rights and remedies provided by law or under this contract.

**SECTION 00 80 00  
SUPPLEMENTARY CONDITIONS  
MODIFICATIONS TO THE GENERAL CONDITIONS**

The following supplements modify, change, delete from, or add to Section 00 70 00 "General Conditions of the Construction Contract for Buildings", revised December, 2011. Where any article of the General Conditions is modified, or a Paragraph, Subparagraph, or Clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph, or Clause shall remain in effect.

**SC-1-DEFINITIONS**

A. Add the following definitions:

1. **QUALITY ASSURANCE ACCEPTANCE TESTING** – This is all sampling and testing performed by the CONTRACTOR to determine at what level the product or service will be accepted for payment. Qualified personnel and laboratories will perform sampling and testing. The AUTHORITY pays for this testing.
2. **QUALITY CONTROL PROGRAM (QC PROGRAM)** – The CONTRACTOR’S, Subcontractor’s or Supplier’s operational techniques and activities that maintain control of the manufacturing process to fulfill the Contract requirements. This may include materials handling, construction procedures, calibration and maintenance of equipment, production process control, material sampling, testing and inspection, and data analysis.
3. **RESIDENT ENGINEER** - The Engineer's authorized representative assigned to make detailed observations relating to contract performance.

**SC-2.4-VISITS TO SITE/PLACE OF BUSINESS**

At General Conditions Article 2.4, delete the first four words of the first sentence (“The Contracting Officer will ...”) and replace with the following words “The Contracting Officer has the right to, but is not obligated to...”

**SC-4.2-VISIT TO SITE**

At General Conditions Article 4.2, delete this article in its entirety and replace with the following article:

- “A. A formal visit to the site will occur as noted on the Invitation to Bid”.

**SC-4.3–EXPLORATIONS AND REPORTS**

At General Conditions Article 4.3, add the following paragraph:

“All reports and other records (if available) are provided for informational purposes only to all plan holders listed with the AUTHORITY as General Contractors, and are available to other planholders upon request. They are made available so Bidders have access to the same information available to the AUTHORITY. The reports and other records are not intended as a substitute for independent investigation, interpretation, or judgment of the Bidder. The AUTHORITY is not responsible for any interpretation or conclusion drawn from its records by the Bidder. While referenced by or provided with the Contract Documents; the recommendations, engineering details, and other information contained in these reports of explorations shall not be construed to supersede or constitute conditions of the Contract Documents.”

**SC-5.4.1 – INSURANCE REQUIREMENTS**

At General Condition Article 5.4.1, delete the second to the last sentence and replace with the following: “The delivery to the AUTHORITY of a written notice in accordance with the policy provisions is required before cancellation of any coverage or reduction in any limits of liability.”

**SC-5.4.2a – WORKERS COMPENSATION INSURANCE**

At General Condition Article 5.4.2a, delete paragraph “a” in its entirety and replace with the following:

- "a. Workers' Compensation Insurance: The Contractor shall provide and maintain, for all employees of the Contractor engaged in work under this contract, Workers' Compensation Insurance as required by AS 23.30.045. The Contractor shall be responsible for Workers' Compensation Insurance for any subcontractor who provides services under this contract. Coverage shall include:
1. Waiver of subrogation against the Authority.
  2. Employer's Liability Protection in the amount of \$500,000 each accident / \$500,000 each disease.
  3. If the Contractor directly utilizes labor outside of the State of Alaska in the prosecution of the work, “Other States” endorsement shall be required as a condition of the contract.
  4. Whenever the work involves activity on or about navigable waters, the Workers' Compensation policy shall contain a United States Longshoreman’s and Harbor Worker’s Act endorsement, and when appropriate, a Maritime Employer’s Liability (Jones Act) endorsement with a minimum limit of \$1,000,000.”



**SC-9.4-CHANGE ORDER**

A. At General Conditions Article 9.4, add the following sentence:

”The AUTHORITY will issue Change Orders for the CONTRACTOR to sign. A Change Order shall be considered executed when the AUTHORITY signs it. The CONTRACTOR’S signature indicates that they accept the Change Order or acknowledge it. Acknowledgement of a Change Order does not surrender the CONTRACTOR’S right to claim.”

**SC-11.8-DELAY DAMAGES**

At General Condition Article 11.8, add the following paragraphs:

11.8.1 For each calendar day that the Work is not Substantially Complete after the expiration of the Contract Time or the completion date has passed, the AUTHORITY shall deduct \$N/A from progress payments.

11.8.2 If no money is due the CONTRACTOR, the AUTHORITY shall have the right to recover these sums from the CONTRACTOR, from the Surety, or from both. These are liquidated damages and not penalties. These charges shall reimburse the AUTHORITY for its additional administrative expenses incurred due to CONTRACTOR’S failure to complete the work within the time specified.

11.8.3 Permitting the CONTRACTOR to continue and finish the work or any part of it after the Contract time has elapsed or the completion date has passed does not waive the AUTHORITY’S rights to collect liquidated damages under this section.

**SC-12.1-WARRANTY AND GUARANTEE**

At General Condition Article 12.1, add the following sentence:

“The failure of the AUTHORITY to strictly enforce the Contract in one or more instances does not waive its right to do so in other or future instances.”

**SC-12.6-CORRECTION OR REMOVAL OF DEFECTIVE WORK**

At General Condition Article 12.6, add the following paragraphs:

“The CONTRACTOR shall establish necessary lines and grades before performing the Work. Work done before necessary lines and grades are established, Work contrary to the AUTHORITY’S instructions, Work done beyond the limits of the Contract, or any extra Work done without authority, will be considered as unauthorized and shall not be paid for by the AUTHORITY, and may be ordered removed or replaced at no additional cost to the AUTHORITY.”

**KETCHIKAN SHIPYARD MEDIUM VOLTAGE LOOP**

**Project Number 19014**

**Construction Documents**

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**SC-15.6– Construction Contract Claim Appeals.**

Delete 15.6 in its entirety.

**END OF SECTION 00 80 00**

## Section 00 85 00 Drawings Index

Drawings	Description	Dated
T1.0	TITLE, INDEX AND PROJECT LOCATION	07/25/2018
E0.0	LEGEND AND NOTES	07/25/2018
E1.0	ELECTRICAL LOCATION PLAN	07/25/2018
E2.0	ENLARGED PLAN – ELECTRICAL EQUIPMENT YARD	07/25/2018
E2.1	ENLARGED PLAN-NORTWEST CORNER OF ASSEMBLY HALL	07/25/2018
E2.2	ENLARGED PLAN-FUTURE REPAIR HALL	07/25/2018
E2.3	ENLARGED PLAN-MACHINE SHOP AND AIR COMPRESSOR BUILDING	07/25/2018
E2.4	ENLARGED PLAN-MACHINE SHOP AND PIER 1	07/25/2018
E3.0	ELECTRICAL ONE-LINE DIAGRAM-BASE BID	07/25/2018
E3.0D	ELECTRICAL ONE-LINE DIAGRAM-BASE BID - DEMO	07/25/2018
E3.1	ELECTRICAL ONE-LINE DIAGRAM-ALT, 1	07/25/2018
E3.1D	ELECTRICAL ONE-LINE DIAGRAM-ALT, 1 - DEMO	07/25/2018
E3.2	ELECTRICAL ONE-LINE DIAGRAM-ALT, 2	07/25/2018
E3.2D	ELECTRICAL ONE-LINE DIAGRAM-ALT, 2 - DEMO	07/25/2018
E3.3	ELECTRICAL ONE-LINE DIAGRAM-ALT, 3	07/25/2018
E3.3D	ELECTRICAL ONE-LINE DIAGRAM-ALT, 3 - DEMO	07/25/2018
E4.0D	480V ONE-LINE DIAGRAMS-BASE BID - DEMO	07/25/2018
E4.0	480V ONE-LINE DIAGRAMS-BASE BID	07/25/2018
E4.1	480V ONE-LINE DIAGRAMS-ALT, 1 & 2	07/25/2018
E4.2	480V ONE-LINE DIAGRAMS-ALT, 3	07/25/2018
E4.3D	480V ONE-LINE DIAGRAMS-ALT, 4 - DEMO	07/25/2018
E4.3	480V ONE-LINE DIAGRAMS-ALT, 4	07/25/2018
E4.4D	480V ONE-LINE DIAGRAMS-ALT, 4 - DEMO	07/25/2018
E4.4	480V ONE-LINE DIAGRAMS-ALT, 4	07/25/2018
E4.5D	480V ONE-LINE DIAGRAMS-ALT, 4 - DEMO	07/25/2018
E4.5	480V ONE-LINE DIAGRAMS-ALT, 4	07/25/2018
E5.0	ELECTRICAL DETAILS	07/25/2018

E5.1	ELECTRICAL DETAILS – REFERENCE DRAWINGS	07/25/2018
C5.0	CIVIL DETAILS	07/25/2018
S0.0	STRUCTURAL NOTES	07/25/2018
S5.0	STRUCTURAL DETAILS	07/25/2018
S5.1	HANDHOLE EXTENSION DETAIL	07/25/2018
S5.2	TYPICAL EQUIPMENT PAD PLAN AND SECTION	07/25/2018

**SECTION 01 11 13**  
**SUMMARY OF WORK**

**PART 1 - GENERAL**

**1.01 RELATED REQUIREMENTS**

- A. All Contract Documents are related to this Section.

**1.02 WORK COVERED BY CONTRACT DOCUMENTS**

- A. Work under this Contract includes all Work required for the project in Ketchikan, Alaska, all in accordance with the terms and conditions of the Contract Documents.
- B. Base Bid Summary of Work: This work shall include all labor, materials, equipment, and supervision required to relocate the electrical substation excluding work for Additive Alternates 1-4. Reference E1.0 Electrical Location Plan – Scope of Work Summary.
- C. Additive Alternates 1-4: This work shall include all labor, materials, equipment, and supervision required to relocate the electrical substation. Reference E1.0 Electrical Location Plan – Scope of Work Summary.

**1.03 CONTRACT**

- A. General: Construct all Work through a single construction contract in accordance with the Contract Documents. The project base bid will be performed in a lump sum contract.

**1.04 WORK BY OTHERS**

- A. Not Used

**1.05 WORK SEQUENCE AND MILESTONES**

- A. Upon receipt of Notice to Proceed (NTP) the CONTRACTOR will be expected to prepare submittals and begin the purchase of critical materials.
- B. The CONTRACTOR shall submit a preliminary Schedule of Values and an Anticipated Construction Schedule at the pre-construction conference. The CONTRACTOR shall submit a final Schedule of Values within 3 weeks of the Notice-to-Proceed.

**1.06 PARKING**

- A. Parking shall be limited to designated areas only. If insufficient area exists, the CONTRACTOR shall make other arrangements.

**1.07 SHUTOFFS AND DISRUPTIONS TO UTILITY SERVICE**

- A. At least two (2) weeks prior to the first planned outage, submit a schedule showing all proposed utility outages. Upon request, submit a written plan describing the justification for the outages and possible impacts to the Operator. The CONTRACTOR shall revise the

schedule to show any planned changes and shall submit the revised schedule promptly to the AUTHORITY.

- B. Plan work to minimize down time. Work with AUTHORITY to schedule disruption for time periods that minimize impacts to the Operator. Shutoffs and disruption to service shall not be allowed during designated critical operating hours. The following table represents the planned work schedule that should be considered for outages. The Contractor shall work with the Operator to facilitate confirmation of the table:

Facility	Criticality	Operating Hours	Notes
Pier 1 SPS #1 thru #10	High	24/7	Two 400 kW generators required
Air Compressor	Low		Two feeders from main switchboard
Blast and Paint	Low		Fed from Air Compressor
West Quonset	Low		Fed from Machine Shop
East Quonset	Low		Fed from Machine Shop
Hazmat	Low		Fed from Machine Shop
OWS	Low		Fed from Machine Shop
Operations	Medium	10/4	
Machine Shop	Medium	10/4	Two feeders from main switchboard
Dry Dock #1	Medium	10/4	12.47kV feeder
North Quonset	High	24/7	Fed from Assembly Hall
Berth One Slab	High	24/7	
Assembly Hall	High	24/7	Fed from Production Center
Production Center	High	24/7	Two 12.47kV feeders
Steel Shop	High	24/7	Fed from Production Center

- C. In particular, coordinate with Owner and Electric Utility all work associated with new power substation, including power distribution loops, pad mount switches, pad mount transformers, and switchboards. Impact on the Operator shall be minimized and not to be conducted without Operator's approval.

**1.08 CONTRACTOR'S USE OF PREMISES**

- A. This is an active vessel production facility. All work shall be coordinated with the operator. Notification 72 hours prior to any safety restrictions of overhead crane usage is required to be submitted to the Operator.
- B. Coordinate use of the premises under direction of AUTHORITY.
- C. Assume full responsibility for protection and safekeeping of furnished products.
- D. Assume full responsibility for the protection of roads and grounds in the project vicinity from construction related activities.
- E. Obtain and pay for use of additional storage, Work, or parking areas needed for construction operations.
- F. Do not stop or otherwise impede vehicle traffic without prior written approval from the AUTHORITY. The CONTRACTOR shall make all necessary provisions, including but not limited to detours, bypasses, and permits, to maintain traffic flow. Submit traffic control plan and schedule for approval no less than twenty (20) working days prior to anticipated traffic disruptions.

- G. Work and Staging Areas - With the exception of vehicle movement for access to and from Work and Staging Areas, restrict all Work to within the limits of construction designated on the plans.
- H. KSY has a 125' lift that can be utilized on this project. Contractor shall separately negotiate and contract for the use of this lift should they so desire. Contractor's use of the 125' Lift
- I. Contractor shall obtain visitor badges permitting ingress for vehicles and personnel to the shipyard.
- J. Contractor shall consult with shipyard operator and abide by all safety and Personal Protective Equipment requirements.
- K. Contractors must comply with all safety and PPE rules within the yard. These can be made available prior to the arrival of the contractors. Mandatory PPE includes hard hats, steel toed safety shoes, gasketed safety glasses, and hearing protection. Hearing protection, hard hats and safety glasses can be obtained from onsite store room.
- L. Other projects may be scheduled and ongoing in the vicinity of this project. Contractor shall coordinate with the Operator to avoid or minimize disruption of delay to any other on-going shipyard projects.

**1.09 USING AGENCY OCCUPANCY**

- A. The Operator at the project location is the Ketchikan Shipyard is Vigor.
- B. Upon the issuance of a Certificate of Substantial Completion by the AUTHORITY, the Operator shall take ownership of the facility and may occupy it.
- C. Refer to the General Conditions for access following substantial completion.

**1.10 PERMITS**

- A. Where a building permit is required by the Authority Having Jurisdiction, the plan review fee and the building permit fee have been paid by the AUTHORITY. The AUTHORITY shall obtain the building permit in its name and shall procure all other permits and licenses, pay all charges, fees and taxes and give all notices necessary and incidental to the due and lawful prosecution of the work.
- B. The Contractor shall procure all permits and licenses, pay all charges, fees, and taxes and give all notices necessary and incidental to the due and lawful prosecution of Work.

**1.11 HAUL ROUTES**

- A. Contractor shall determine the requirements for and shall comply with applicable local, municipal, and DOT/PF haul requirements, routes and restrictions.
- B. Obtain required approvals for the use of haul routes, and submit to the AUTHORITY upon request.

**PART 2 - PRODUCTS**

**Not Used**

**PART 3 - EXECUTION**

**Not Used**

**END OF SECTION**

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**SECTION 01 12 19  
CONTRACTOR'S CERTIFICATION OF SUBCONTRACTS**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Procedures for preparing, submitting and accepting subcontracts.

**1.02 RELATED REQUIREMENTS**

- A. Section 00 10 00 - Instructions to Bidders
- B. Section 00 43 00 - Subcontractor List
- C. Section 00 70 00 - General Conditions: Subcontractor Certification and Approval
- D. Section 00 80 00 – Supplementary Conditions: Subcontract Provisions
- E. Section 01 33 00 - Submittals: Submittal Procedures

**1.03 PREPARATION OF CERTIFICATION**

- A. Certification Forms: Use forms provided by AUTHORITY
- B. CONTRACTOR shall prepare certification form and submit to the AUTHORITY prior to the start of work. Where required, attach additional information to the certification form.
- C. Substitute certification forms will not be considered.

**1.04 SUBMITTAL OF CERTIFICATION**

- A. The CONTRACTOR shall submit certification forms for all subcontractors for review and approval by the AUTHORITY.

**1.05 CONSIDERATION OF CERTIFICATION**

- A. Following receipt of submitted subcontractor certification forms, the AUTHORITY will review for the following, at minimum:
  - 1. Completeness of forms and attachments
  - 2. Proper execution (signatures) of forms and attachments
- B. Incomplete or improperly executed subcontractor certification forms will be returned to the CONTRACTOR for revision and resubmittal.
- B. CONTRACTOR shall remove its subcontractor from the project site until its subcontractor certification form is submitted, reviewed, and approved.

- C. The AUTHORITY will not process payments for work performed by a non-certified subcontractor.

**1.06 ACKNOWLEDGMENT OF CERTIFICATION**

- A. Submittals which have been examined by the AUTHORITY and are determined to be complete and properly executed shall be acknowledged as such by the Project Engineer's signature.

**PART 2 - PRODUCTS** **Not Used**

**PART 3 - EXECUTION** **Not Used**

**END OF SECTION**

<b>ALASKA INDUSTRIAL DEVELOPMENT EXPORT AUTHORITY</b>	<b>SUBCONTRACTOR CERTIFICATION</b>	01 12 19A
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**Note: The Contractor shall provide this form for ALL subcontractors working on this project.** This form is applicable to all projects, including Small Procurement Contracts, and must be completed in full.

PROJECT: Ketchikan Shipyard Medium Voltage Loop PROJ. #: 19014

PRIME CONTRACTOR: \_\_\_\_\_

Pursuant to the Contract Documents, we hereby stipulate the following concerning the award of Work to the last Subcontractor on the following list:

1. First Tier Subcontractor: \_\_\_\_\_ DBE? Yes  No   
 Second Tier: \_\_\_\_\_ DBE? Yes  No   
 Third Tier: \_\_\_\_\_ DBE? Yes  No   
 Fourth Tier: \_\_\_\_\_ DBE? Yes  No
2. Date of Subcontract: \_\_\_\_\_
3. Amount of Subcontract: \$ \_\_\_\_\_
4. Scope of Work: \_\_\_\_\_  
 \_\_\_\_\_
5. Are the following documents kept on file by both the Contractor and the Subcontractor (check the appropriate answer)?  
 Contract Minimum Wage Schedule Yes  No
6. Does the Subcontract contain provisions for prompt payment, release of retainage, and interest on late payment and retainage conforming to AS 36.90.210? Yes  No
7. Does the Subcontract specifically bind the Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of the Department and does it contain waiver provisions and termination provisions as required by the Contract Documents? Yes  No
8. a. Does the Subcontractor have adequate insurance coverages as specified in the Contract Documents? Yes  No   
 If not, does the Contractor stipulate that the insurance limits of the Subcontractor are acceptable to the Contractor and that he has notified his insurance carrier of the reduced insurance limits? Yes  No   
 b. Does the evidence of insurance certify that the policies described thereon comply with all aspects of the insurance requirements for this project? Yes  No

Subcontractor Name: \_\_\_\_\_

c. Does the evidence of insurance list the Department as an "Additional Insured" or "Certificate Holder"?

Yes  No

d. Does the evidence of insurance commit to providing 30 day written notice of cancellation or reduction of any coverage?

Yes  No

e. Insurance Expiration dates:

Comprehensive or Commercial General Liability: \_\_\_\_\_

Automobile: \_\_\_\_\_ Workers' Compensation: \_\_\_\_\_

(Other): \_\_\_\_\_

9. Copies of the following professional certifications, licenses, and registrations are attached (circle all that apply):

- Business License (mandatory)
- Contractor License (mandatory)
- Land Surveyor's License
- Electrical Administrator's License (mandatory for electrical subs)
- Mechanical Administrator's License (mandatory for mechanical subs)
- Engineer/Architect
- Other: \_\_\_\_\_

10. Exceptions to any of the above are explained as follows: \_\_\_\_\_

**CERTIFICATION (to be completed and signed by PRIME CONTRACTOR):** I certify all the above to be true and correct.

Signature: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Company: \_\_\_\_\_

Date: \_\_\_\_\_

**AUTHORITY'S APPROVAL/DISAPPROVAL**

The subject subcontract is **APPROVED**. Nothing in this approval should be construed as relieving the Prime Contractor of the responsibility for complete performance of the work or as a waiver of any right of the Approval to reject defective work.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Project Engineer

The subject subcontract is **NOT APPROVED** for the following reasons:

\_\_\_\_\_

\_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Project Engineer

**SECTION 01 26 63  
CHANGE PROCEDURES**

**PART 1 - GENERAL**

**1.01 RELATED REQUIREMENTS**

- A. Section 00 31 20 - Bid Schedule
- B. Section 00 51 00 – Construction Contract
- C. Section 00 70 00 - General Conditions
- D. Section 00 80 00 - Supplementary Conditions: Modifications to General Conditions Section 00 70 00
- E. Section 01 29 73 - Schedule of Values
- F. Section 01 29 76 – Application for Payment
- G. Section 01 32 00 – Work Schedules and Reports
- H. Section 01 73 00 – Execution Requirements: Project Record Documents

**1.02 SUBMITTALS**

- A. Submit the name of the individual authorized to accept changes, and to be responsible for informing others in CONTRACTOR's employ of changes in the Work.
- B. Submit with each price proposal a complete, detailed, itemized cost breakdown defining all impacts on Contract Price and Contract Time, in sufficient detail to fully explain the basis for the proposal.
- C. All change forms shall be provided by the AUTHORITY.

**1.03 CHANGE AUTHORIZATION**

- A. In accordance with Section 00 70 00 - General Conditions, Part 9 Changes, the AUTHORITY may authorize changes to the Work. The AUTHORITY may authorize changes in one of the following ways:
  - 1. Directive (Section 00 70 00, Article 9.3)
  - 2. Change Order (CO) (Section 00 70 00, Article 9.4)
  - 3. Acceptance of Shop Drawing variations, which have been identified by CONTRACTOR. (Section 00 70 00, Article 9.5)
  - 4. Interim Work Authorization (IWA) (Section 00 70 00, Article 9.10)
  - 5. Contingency Authorization (for CM/GC contracts only) (Section 00 70 00, Paragraph 13.0.3 (b) (2))

#### **1.04 CHANGE PROCEDURES**

- A. The AUTHORITY may initiate change to the contract by issuing to the CONTRACTOR a Request for Proposal (RFP) document. The RFP may include:
  - 1. Change narrative.
  - 2. Supplementary revised drawings, specifications, additional details, or sketches.
  - 3. Other information as deemed appropriate.
  
- B. The CONTRACTOR shall request a change to the contract by submitting to the AUTHORITY a written Change Notice on a form provided by the AUTHORITY. The AUTHORITY may respond by rejecting it, or with a RFP to initiate contract change. The CONTRACTOR'S Change Notice shall include, at minimum:
  - 1. A description of the proposed change with a statement of the justification of the change.
  - 2. Statement of the effect of the change on Contract Price and Contract Time.
  - 3. The information required in Section 00 70 00 - General Conditions, Part 15 Claims for Adjustments and Disputes.
  
- C. Upon receipt of a Request for Proposal (RFP) from the AUTHORITY, the CONTRACTOR shall respond with a price proposal. The CONTRACTOR shall make every effort to return its price proposal in response to the RFP within the time frame requested by the AUTHORITY, but in no event later than 14 calendar days from date the RFP is issued. For work to be performed after the execution of a Change Order or Contingency Authorization, the basis of pricing shall be estimated. For work performed prior to the execution of a Change Order or Contingency Authorization, the pricing shall be based upon documentation of actual incurred costs. The price proposal shall include:
  - 1. A complete, detailed, itemized price breakdown.
  - 2. For the prime contractor and subcontractors, detailed documentation of costs for direct costs, labor, equipment, consultants, sub-contractor markups, overhead and profit, and other items set forth in General Conditions Section 00 70 00, Part 10.
  - 3. Other information as required by the AUTHORITY.
  
- D. Upon receipt of pricing response to a RFP, the AUTHORITY may execute a change to the contract. The issuance of an RFP or the receipt of pricing response to an RFP shall not obligate the AUTHORITY to execute a change to the contract.

#### **1.05 DIRECTIVES**

- A. The AUTHORITY may issue Directives as per Section 00 70 00 – General Conditions, Article 9.3.

#### **1.06 INTERIM WORK AUTHORIZATIONS (IWA)**

- A. The AUTHORITY may issue Interim Work Authorizations in accordance with Section 00 70 00 – General Conditions, Article 9.10.

- B. IWAs may be issued to authorize the commencement of additional work in advance of the execution of a Change Order or Contingency Authorization.
- C. Work authorized by IWA shall be converted to a negotiated Change Order. except that, for CM/GC contracts only, the work authorized by an IWA may be converted to a Contingency Authorization provided it does not result in an extension of Contract Time.
- D. The price on the IWA form shall be an estimated limit not to be exceeded by the CONTRACTOR without prior amendment of the IWA by the AUTHORITY. The AUTHORITY shall not be obligated to compensate the CONTRACTOR for costs in excess of the amount on the IWA.
- E. Upon the execution of an IWA, the CONTRACTOR is authorized to begin the specified work. The CONTRACTOR shall track its costs using Cost of Work procedures. The CONTRACTOR shall use the AUTHORITY's Cost of the Work form and shall submit the data to the AUTHORITY at the close of each work day. A separate Cost of Work form is required for each IWA.

**1.07 CHANGE ORDER**

- A. Any change in Contract Time, Contract Price, or associated responsibility within the general scope of the Contract, shall be made by Change Order.
- B. The CONTRACTOR shall use forms furnished by the AUTHORITY for Change Orders.

**1.08 CONTINGENCY AUTHORIZATIONS (CM/GC Contracts Only)**

- A. Not used.
- B. This provision for Contingency Authorizations shall apply only to Construction Manager/General Contractor (CM/GC) construction contracts.
- C. The use of Construction Contingency and CONTRACTOR'S Contingency components of the Guaranteed Maximum Price (GMP) of CM/GC construction contracts shall occur only with the execution of a Contingency Authorization (CA) form provided by the AUTHORITY.
- D. Contingency Authorizations shall be used only to effect change of scope within the general scope of the Contract, and to provide associated monetary compensation from contingency components of the GMP, provided such change will not result in an extension of the Contract Time.
- E. Contingency Authorizations shall not be used to extend the Contract Time. The CONTRACTOR shall follow Change Order procedures for the consideration of any change of scope that may result in an associated extension of the Contract Time.
- F. With the execution of a Contingency Authorization, the CONTRACTOR agrees to waive any claim to any time impact associated with the Work set forth in the Contingency Authorization.
- G. A Contingency Authorization shall be used to establish the use of the following contingencies:

1. Construction Contingency components of the GMP per Section 00 70 00 – General Conditions, Paragraph 13.0.3.b.2.i. On the Contingency Authorization form, the AUTHORITY shall sign as the issuer, and the CONTRACTOR shall sign with its acknowledgement.
2. CONTRACTOR'S Contingency component of the GMP per Section 00 70 00 – General Conditions, Paragraph 13.0.3.b.2.ii, The CONTRACTOR shall execute the Contingency Authorization form as the issuer, and the AUTHORITY may sign with its acknowledgement.

### **1.09 CHANGE PRICING AND TIME ANALYSIS**

- A. Unless specified elsewhere, Section 00 70 00 - General Conditions, Part 10 shall be applied to the negotiation of all changes to the scope of the contract.
  1. Unit Price, when unit prices are contained in the Contract.
  2. Mutually acceptable Lump Sum Price, including overhead and profit.
  3. Cost of the Work
- B. UNIT PRICE CHANGE - For unit price CHANGE PROCEDURES, prices shall be determined by multiplying the contractual unit price(s) by the estimated quantities of Work associated with changed scope. Payment will be based on the actual installed quantities. Document actual installed quantities and submit information requested by the AUTHORITY on a daily basis for its approval and certification. Refer to Section 00 70 00 - General Conditions, Part 10 for additional requirements.
- C. LUMP SUM PRICE CHANGE - The CONTRACTOR and the AUTHORITY shall negotiate an equitable price (and time adjustment if appropriate) in good faith. If negotiations do not result in a mutually acceptable lump sum price, the AUTHORITY may, at its discretion, direct the CONTRACTOR to perform the work under Cost of the Work Change Order.
- D. COST OF THE WORK CHANGE – The CONTRACTOR shall document Cost of the Work on forms acceptable to the AUTHORITY, and shall submit documented costs to the DEPARTMENT daily for verification and certification. Cost of the Work pricing proposals shall be supported by invoices for substantiation of purchase and rental costs and with additional data as may be requested by AUTHORITY.
- E. Time Analysis for CHANGE ORDER PROCEDURES shall be performed as described in Section 01 32 00 – Work Schedules and Reports.
- F. The AUTHORITY shall have the right to audit all records in possession of CONTRACTOR relating to activities covered by CONTRACTOR's pricing of Contract CHANGE ORDER PROCEDURES, including Cost of the Work pricing, as set forth in Section 00 70 00 - General Conditions. If CONTRACTOR is a joint venture, the right of AUTHORITY shall apply collaterally to the same extent to the records of joint venture sponsor, and of each individual joint venture member.

### **1.10 FORM EXECUTION**

- A. Contract forms issued under this section shall be effective the date the AUTHORITY's authorized person signs the form.



- B. For Change Orders, CONTRACTOR signature will indicate acceptance of the terms or acknowledgment of order, depending on box checked. Acknowledgment of Change Order does not substitute for notification requirements of Section 00 70 00 - General Conditions, Article 15.1.

**1.11 PAYMENT**

- A. The CONTRACTOR shall promptly revise its Schedule of Values and Application for Payment forms to record each authorized Change Order and each authorized Contingency Authorization as a separate line item. For Change Orders, adjust the Contract Price as shown on the Change Order.
- B. The CONTRACTOR shall promptly revise and resubmit its progress schedules to reflect any change in Contract Time, including adjustments for other items of Work affected by the change.
- C. Payment for contract changes shall be made only following the execution of Change Orders or Contingency Authorizations and the inclusion of these change documents by reference on the Application for Payment form.
- D. Payment shall not be made for Work authorized via Interim Work Authorization.

**PART 2 – PRODUCTS**

**Not Used**

**PART 3 – EXECUTION**

**Not Used**

**END OF SECTION**

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**SECTION 01 29 73  
SCHEDULE OF VALUES**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Requirements for preparing and submitting the schedule of values.

**1.02 RELATED REQUIREMENTS**

- A. Section 00 70 00 - General Conditions: Schedule of Values.
- B. Section 01 11 13 - Summary of Work: Work sequence.
- C. Section 01 26 63 – Change Procedures
- D. Section 01 29 76 - Applications for Payment: Procedures for Applications for Payment.
- E. Section 01 32 00 – Work Schedules and Reports
- F. Section 01 33 00 – Submittal Procedures
- G. Section 01 77 00 – Contract Closeout Procedures
- H. Section 01 71 13 – Mobilization and Demobilization
- I. Section 01 91 00 - Commissioning

**1.03 FORMAT**

- A. Form and content must be acceptable to AUTHORITY.
- B. Form shall have a signature block for submission by CONTRACTOR and a signature block for approval by AUTHORITY.
- C. Content shall include the following column headings.
  - 1. CPM Activity Number
  - 2. CPM Activity Description
  - 3. CPM Dollar Value
  - 4. Current Percent Complete
  - 5. Current Dollar Complete
  - 6. Previous Percent Complete
  - 7. Previous Dollar Complete
  - 8. Percent Complete this Period
  - 9. Dollar Complete this Period

**1.04 CONTENT**

- A. List installed value of each activity shown on the submitted and approved CPM Schedule.

- B. For items on which payments will be requested for stored products, list sub values for cost of stored products with taxes paid.
- C. Limits for specific line item values shall be as specified below and shall be included on all approved Schedules of Values and Applications for Payment.
  - 1. Mobilization and Demobilization: Unless specified elsewhere, the assigned values for mobilization and demobilization shall be based upon the estimated value of specified Work for each of these tasks.
  - 2. Contract Closeout Procedures: Unless specified elsewhere, the assigned values for tasks specified under Contract Closeout Procedures shall be based upon the estimated value of each task. The breakdown shall include separate amounts for the requirements of Final Completion and Final Acceptance, as set forth below:

<u>Contract Price</u>	<u>Value for Final Completion</u>	<u>Value for Final Acceptance</u>
Less than \$200,000	\$2,000	\$2,000
\$200,000 - \$500,000	\$5,000	\$5,000
\$500,001 - \$1,000,000	\$10,000	\$10,000
\$1,000,001 - \$5,000,000	\$20,000	\$20,000
Greater than \$5,000,000	\$30,000	\$30,000

- D. The sum of values listed on the Schedule of Values shall equal total Contract Price.
- E. A Schedule of Values containing costs for early activities in excess of actual value (“front end loading”) will be rejected by the AUTHORITY until the CONTRACTOR corrects the deficiency. The AUTHORITY shall not be obligated to pay the CONTRACTOR until front end loading is eliminated and the Schedule of Values is approved.

**1.05 SUBMITTAL**

- A. Submit proposed Schedule of Values with updated CPM Schedule per specification sections for Summary of Work, Work Schedules and Reports, and Submittals.
- B. Submit Schedule of Values with updated completion percentages sufficiently in advance of each Application for Payment to enable the AUTHORITY to resolve differences.

**1.06 SUBSTANTIATING DATA**

- A. When the AUTHORITY requires substantiating information, submit data justifying line item amounts in question.
- B. Provide one copy of data with cover letter for each copy of the Application for Payment. Show application number and date, and line item by number and description.

**PART 2 - PRODUCTS** **Not Used**

**PART 3 - EXECUTION** **Not Used**

**END OF SECTION**

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**SECTION 01 29 76  
APPLICATION FOR PAYMENT**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Procedures for preparation and submittal of Application for Payment.

**1.02 RELATED REQUIREMENTS**

- A. Section 00 31 20 – Bid Schedule
- B. Section 00 70 00 - General Conditions
- C. Section 00 80 00 – Supplementary Conditions
- D. Section 01 11 13 – Summary of Work
- E. Section 01 26 63 – Change Order Procedures
- F. Section 01 31 13 – Job Site Administration
- G. Section 01 32 00 – Work Schedules and Reports
- H. Section 01 33 00 –Submittal Procedures
- I. Section 01 29 73 - Schedule of Values
- J. Section 01 45 00 – Quality Control
- K. Section 01 45 29 – Testing Laboratory Services
- L. Section 01 51 00 – Construction Facilities
- M. Section 01 52 13 – Field Offices and Sheds
- N. Section 01 71 13 – Mobilization
- O. Section 01 77 00 - Contract Closeout Procedures
- P. Section 01 78 39 – Project Record Documents

**1.03 FORMAT**

- A. Submit Application for Payment on form approved by the AUTHORITY.

**1.04 PREPARATION OF APPLICATIONS**

- A. Type required information on Application for Payment form acceptable to the AUTHORITY.
- B. Execute certification by original signature of authorized officer upon each copy of the Application for Payment.
- C. Show breakdown of costs for each item of the Work on accepted Schedule of Values as specified in Section 01 29 73 – Schedule of Values.
- D. List each authorized Change Order as an extension on continuation sheet, listing Change Order number and dollar amount as for an original item of Work.
- E. Submit Stored Materials Worksheet with every Application for Payment requesting payment for stored materials. Show only direct costs of materials and freight. Submit documentation in accordance with Section 00 70 00 – General Conditions, Article 13.5 Stored Materials and Equipment, for materials shown in column titled “New Material This Pay Request Period.”

**1.05 SUBMITTAL PROCEDURES**

- A. Submit two originals of each Application for Payment at one-month intervals. Each document shall bear original signature of authorized executive.
- B. Submit with AUTHORITY-approved transmittal letter bearing AUTHORITY’s project number.

**1.06 SUBSTANTIATING DATA**

- A. When AUTHORITY requires substantiating information, submit all requested data justifying line item amounts in question.
- B. Provide one copy of data with cover letter for each copy of Application for Payment. Show Application for Payment number and date, and line item by number and description.

**1.07 SUBMITTALS WITH APPLICATION FOR PAYMENT**

- A. Submit the following for review sufficiently in advance of Application for Payment to allow detailed review by AUTHORITY and resolution of differences.
  - 1. Schedule of Values with updated percentages of completion as required by Section 01 29 73 – Schedule of Values.
- B. Submit the following with each Application for Payment.
  - 1. Updated construction schedule as required by Section 01 32 00 – Work Schedules and Reports.
  - 2. Updated Project Record Documents as required by Section 01 78 39 – Project Record Documents.
  - 3. Letter certifying that all Project Record Documents, including as-built drawings and submittals are current.

**1.08 ADDITIONAL REQUIREMENTS FOR FIRST APPLICATION FOR PAYMENT**

- A. The first Application for Payment will be processed after the Resident Engineer has received all of the following:
1. Superintendent Data (Section 00 70 00 – General Conditions, Article 6.2)
  2. Progress Schedule (Section 00 70 00 – General Conditions, Paragraph 6.6.1, & Section 01 32 00 – Work Schedules and Reports)
  3. Schedule of Values (Section 00700 – General Conditions, Paragraph 6.6.2, & Section 01 29 73 – Schedule of Values)
  4. Submittal Schedule (Section 00 70 00 – General Conditions, Paragraph 6.6.2)
  5. Safety Representative Designation (Section 00 70 00 – General Conditions, Article 6.18)
  6. Building Permits (Section 00 70 00 – General Conditions, Article 7.2)
  7. Name of Individual Authorized to Accept Changes (Section 01 26 63 – Change Order Procedures)
  8. CONTRACTOR's Management Team (Section 01 31 13 – Job Site Administration)
  9. CONTRACTOR Quality Control Program and Plan (Section 01 45 00 – Quality Control)
  10. National Bureau of Standards Inspection Report (Section 01 45 29 – Testing Laboratory Services)
  11. Freeze Protection Plan (Section 01 51 00 – Construction Facilities)
  12. Construction Site Layout Plan (Section 01 71 13 – Mobilization and Demobilization)
  13. Traffic Control Plan and Haul Routes (Section 01 11 13 – Summary of Work)
  14. Pre-Construction Property and Structure Assessments (Section 01 51 00 – Construction Facilities)
  15. Temporary Facilities Plan. (Section 01 52 13 – Field Offices and Sheds)

**PART 2 - PRODUCTS**

**Not Used**

**PART 3 - EXECUTION**

**Not Used**

**END OF SECTION**



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**SECTION 01 31 13  
JOB SITE ADMINISTRATION**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. General requirements for the administration of the construction contract.

**1.02 RELATED REQUIREMENTS**

- A. Section 00 70 00 – General Conditions
- B. Section 01 29 76 – Application for Payment
- C. Section 01 31 14 – Work Coordination
- D. Section 01 32 00 – Work Schedules and Reports
- E. Section 01 33 00 – Submittal Procedures
- F. Section 01 45 00 – Quality Control
- G. Section 01 77 00 – Contract Closeout Procedures

**1.03 AUTHORITY PROJECT MANAGEMENT TEAM**

- A. The AUTHORITY's Contracting Officer will issue a Delegation of Authority letter to the CONTRACTOR after Contract Award.
- B. The Delegation of Authority letter will designate the members of the AUTHORITY's project management team, and delegate levels and limitations of contractual authority, all in accordance with Section 00 70 00 - General Conditions, Article 2.1 Authorities and Limitations.
- C. The CONTRACTOR shall sign the Delegation of Authority letter to acknowledge its understanding of the instructions contained therein.

**1.04 CONTRACTOR'S PROJECT MANAGEMENT TEAM**

- A. For Construction Manager/General Contractor (CM/GC) construction contracts, the CONTRACTOR shall staff the construction project for its entire duration with the same personnel as proposed in the CM/GC proposal for pre-construction services.
- B. Regardless of delivery method, the CONTRACTOR's Project Management Team shall be capable of performing the following duties, including but not limited to:
  - 1. Maintain the schedule in the progress of Work and resolve construction related issues.

2. Coordinate permitting and construction activities to ensure timely completion of the Work.
3. Maintain a CPM schedule as specified in Section 01 32 00 - Work Schedules and Reports.
4. Coordinate construction activities of suppliers and subcontractors with those of the CONTRACTOR and each other to ensure timely deliveries for installation.
5. Coordinate and effectively manage the construction activities of subcontractors to maintain the Contract schedule and quality requirements.
6. Coordinate necessary inspections with the AUTHORITY, approved Testing Laboratory, and other agencies as required for the progress of the Work.
7. Participate in Project meetings with the AUTHORITY and the Architect/Engineering Team to review the progress of the construction, and identify and resolve outstanding construction-related issues.
8. Coordinate the installation, operation and maintenance of temporary utilities required during construction.
9. Prior to submittal of Shop Drawings, Product Data, Samples and other submittals, as specified in Section 01 33 00 -- Submittal Procedures, review for compliance with the Contract Documents and coordination with other work.
  - a. Check field dimensions and clearance dimensions.
  - b. Check relation to available space.
  - c. Check anchor bolt settings.
  - d. Review the effect of changes, if any, on the Work of other subcontracts or by others.
  - e. Check compatibility of equipment and work of the various trades.
  - f. Check motor voltages and control characteristics.
  - g. Coordinate controls and interlocks: Voltages and wiring of electric switches and relays.
  - h. Coordinate wiring and control diagrams.
  - i. Certify compliance with Contract Documents or list differences.
10. Prepare coordination drawings, as specified in Section 01 31 14 - Work Coordination.
  - a. Prepare, as required to ensure coordination of Work of, or affected by mechanical and electrical Work, or to resolve conflicts
  - b. Reproduce and distribute reviewed copies to all concerned parties
11. Observe required testing and maintain a record of tests. Document in the record:
  - a. Testing Laboratory and name of inspector
  - b. Subcontractor
  - c. Manufacturer's representative present
  - d. Date and time of testing
  - e. Type of product or equipment
  - f. Type of test, and test results
  - g. Location of each test
  - h. Retesting required
  - i. Other documentation upon request

12. Verify that Subcontractors maintain an accurate and up-to-date set of Contract Documents and record documents.
  13. Observe the work for compliance with requirements of the Contract Documents, maintaining a list of observed deficiencies and discrepancies.
  14. Equipment Start-up:
    - a. Check to ensure that utilities and specified connections are complete and that equipment is in operable condition.
    - b. Observe testing, adjusting, and balancing.
    - c. Record results, including time and date of start-up.
  15. Inspection of Equipment:
    - a. Prior to inspection, check that equipment is clean, repainted as required, tested, and operational.
    - b. Assist inspector; prepare list of items to be completed or corrected.
  16. Assemble Project Record Documents from subcontractors and ensure that completed Project Record Documents are submitted to the AUTHORITY in accordance with Section 01 77 00 - Contract Closeout Procedures, and other requirements of the Contract Documents.
- C. Execute Request for Information (RFI) Procedures.
1. Submit RFIs in writing to the AUTHORITY in a format approved by the DEPARTMENT.
  2. The response to the RFI is formally issued to the CONTRACTOR when the AUTHORITY signs and issues formal direction to the CONTRACTOR.
  3. The AUTHORITY may request it's Architect/Engineers of record to provide recommendations before the AUTHORITY issues the RFI response to the AUTHORITY.
- D. Upon request, the CONTRACTOR shall submit all correspondence, including letters, memoranda, meeting minutes, transmittals, Request for Information, technical submittal transmittals, Requests for Change, specified Notices, and any other documentation using forms and format provided by or otherwise approved by the AUTHORITY.

**PART 2 – PRODUCTS**

**Not Used**

**PART 3 – EXECUTION**

**Not Used**

**END OF SECTION**

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**SECTION 01 31 14**  
**WORK COORDINATION**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Project Work coordination, and coordination with work of other contracts.

**1.02 RELATED REQUIREMENTS**

- A. Section 00 70 00 – General Conditions
- B. Section 01 11 13 – Summary of Work
- C. Section 01 31 13 – Job Site Administration
- D. Section 01 72 00 – Utilities Coordination
- E. Section 01 73 29 – Cutting and Patching

**1.03 REQUIREMENTS**

- A. Coordinate work of various sections of Specifications to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items installed by AUTHORITY or under separate contracts.
- B. Verify that characteristics of elements of interrelated operating equipment are compatible; coordinate work of various sections that have interdependent responsibilities for installing connection to, and placing such equipment in service.
- C. Coordinate space requirements and installation of electrical, mechanical, and other special work, which are indicated diagrammatically on the Contract Drawings. Follow routing shown for ducts, conduits, pipes etc., as closely as practicable; make runs parallel with lines of buildings and roads. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. Conceal ducts, wiring, and pipes in finished areas unless otherwise indicated. Coordinate locations of fixtures and outlets with finish elements.
- E. Whenever the Work of a Subcontractor is dependent upon the Work of other Subcontractors, contractors, or utility company contractors installing utilities under contract with the AUTHORITY, then the CONTRACTOR shall require the Subcontractor to:
  - 1. Coordinate its Work with the dependent work.
  - 2. Provide dependent data and requirements.
  - 3. Supply and install items to be built into dependent work of others.
  - 4. Make provisions for dependent work of others.
  - 5. Examine dependent drawings, specifications and submittals.

6. Examine previously placed dependent work.
7. Check and verify dependent dimensions of previously placed work.
8. Notify CONTRACTOR of previously placed dependent work or dependent dimensions, which are unsatisfactory or will prevent a satisfactory installation of its Work.
9. Not proceed with its Work until the unsatisfactory dependent conditions have been corrected.
10. CONTRACTOR shall require subcontractors to participate in coordination meetings as required by the AUTHORITY.

**PART 2 – PRODUCTS**

**Not Used**

**PART 3 – EXECUTION**

**Not Used**

**END OF SECTION**

**SECTION 01 31 19  
PROJECT MEETINGS**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Requirements for various meetings during the construction project.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 11 13 - Summary of Work: Coordination of Work.
- B. Section 01 32 00 – Work Schedules and Reports: Progress Schedules.
- C. Section 01 33 23 - Shop Drawings, Product Data, and Samples.
- D. Section 01 45 00 - Quality Control: CONTRACTOR responsibilities.
- E. Section 01 73 00 – Execution Requirements; Project Record Documents; Operation and Maintenance Data.

**1.03 PRECONSTRUCTION CONFERENCES**

- A. AUTHORITY will administer preconstruction conference for execution of Contract and exchange of preliminary submittals. Attendance by all key CONTRACTOR and Subcontractor project personnel is required. The CONTRACTOR shall notify and invite in writing to the pre-construction conference all serving utilities at least 72 hours in advance of the conference.
- B. AUTHORITY may administer site mobilization conference at Project site for clarification of CONTRACTOR responsibilities in use of site and for review of administrative procedures.
- C. AUTHORITY will document the meeting and distribute minutes within 48-hours of adjournment. Minutes will be typed, reflecting date, list of attendees and in format to facilitate correction of previous meeting minutes. Distribution will be to all attendees and those affected by discussions or decisions made at meeting.

**1.04 PREINSTALLATION CONFERENCES**

- A. When required in an individual specification section, and as shown in the CONTRACTOR's quality control plan, or as directed by the AUTHORITY, convene a pre-installation conference prior to commencing Work for a specific item.
- B. Require attendance of entities directly affecting, or affected by, Work of the section.
- C. Review conditions of installation, preparation and installation procedures, and coordination with related Work.



- D. Record significant discussions and agreements and disagreements of each conference, and approved schedule. Distribute record of conference to all attendees within 24-hours of adjournment.

**1.05 WEEKLY PROGRESS MEETINGS**

- A. The CONTRACTOR shall administer Weekly Progress Meetings on a regular day and time, which is mutually convenient to both the AUTHORITY and the CONTRACTOR. These meetings shall be documented by the CONTRACTOR.
- B. Weekly Progress Meeting shall be attended by all key CONTRACTOR and, as appropriate, Subcontractor project personnel.
- C. The CONTRACTOR shall furnish copies of its current Two Week Look Ahead Schedule, per Section 01 32 00 – Work Schedules and Reports, to all attendees of the meeting. This schedule will be reviewed in detail during the meeting and will be used for the coordination of activities by others.
- D. Weekly Progress Meetings will also be used to review other key aspects of the Work, such as safety, quality, critical items, etc.
- E. Meeting Minutes: The CONTRACTOR shall document the meetings and distribute minutes within 48-hours of adjournment. Minutes shall be typed, reflecting date, attendees, and in format to facilitate correction of previous meeting minutes. Distribution shall be to all attendees and those affected by discussions or decisions made at meeting.

**1.06 SAFETY MEETING**

- A. The CONTRACTOR shall conduct Safety Meetings as required by its project Safety Program.
- B. The CONTRACTOR shall invite the AUTHORITY to attend Safety Meetings.

**1.07 OTHER MEETINGS**

- A. At various times throughout the duration of the Contract, the CONTRACTOR will be required to attend meetings as requested by the AUTHORITY. It is anticipated that such meetings will involve coordination with others, project schedule review, problem resolution, change order negotiations, and other topics of mutual importance.

**PART 2 – PRODUCTS**

**Not Used**

**PART 3 – EXECUTION**

**Not Used**

**END OF SECTION**

**SECTION 01 32 00**  
**WORK SCHEDULES AND REPORTS**

**PART 1 – GENERAL**

**1.01 SECTION INCLUDES**

- A. Requirements for the preparation and maintenance of the construction CPM schedule, recovery schedules, time impact evaluation, monthly project status reports, two week look-ahead schedules, and daily construction reports.

**1.02 RELATED REQUIREMENTS**

- A. Section 00 70 00 – General Conditions
- B. Section 00 80 00 – Supplementary Conditions
- C. Section 01 11 13 – Summary of Work
- D. Section 01 26 63 – Change Order Procedures
- E. Section 01 29 73 – Schedule of Values
- F. Section 01 29 76 – Application for Payment
- G. Section 01 31 13 – Job Site Administration
- H. Section 01 31 19 – Project Meetings
- I. Section 01 33 00 – Submittal Procedures

**1.03 SUMMARY**

- A. Scheduling of Work under this Contract shall be performed by CONTRACTOR in accordance with the requirements of this Section.
- B. CPM Schedule shall be based upon, and incorporate, Contract milestone and completion dates as specified in Section 00 80 00, Supplementary Conditions, and Section 01 11 13, Summary of Work.
- C. Definitions
  - 1. Project Schedule - The schedule prepared or updated by the CONTRACTOR to the requirements specified herein. The project schedule shall be used to measure the progress of the work and aid in the evaluation of time impacts to the project.
  - 2. Anticipated CPM Schedule - The schedule prepared by the CONTRACTOR defining the planned work in the first 90 calendar days of the contract.
  - 3. Interim CPM Schedule for Design Build - The schedule prepared by the CONTRACTOR for Design Build projects where the Finalized CPM Schedule cannot be completed until after completion of design.

4. Finalized CPM Schedule - The baseline schedule prepared by the CONTRACTOR that shows the sequence and dates in which the CONTRACTOR proposes to perform the work. Once approved, it becomes the basis upon which the CONTRACTOR performs periodic schedule updates.
5. Periodic Schedule Updates - Progress updates to the approved project schedule, shall occur monthly prior to, and included with, each pay application.
6. Time Impact Evaluation (TIE) - Forward looking schedule analysis technique that adds a modeled delay to an accepted contract schedule to determine the possible impact of that delay to the project completion.
7. Fragnet - A sequence of new activities that are proposed to be added to project schedule to demonstrate the influence of the delay or impact to the project's contractual dates. A Fragnet is created using a 'Reflection' of the approved project schedule that immediately preceded the delay.

**D. Required Schedules**

1. Anticipated CPM Schedule - Submit the Anticipated CPM Schedule, defining the CONTRACTOR's planned operations for the first 90 Calendar days after Notice-to-Proceed, for approval within 15 Calendar days after the NTP is acknowledged, or at the preconstruction conference, whichever comes first. The approved Anticipated Preliminary Project Schedule will be used for payment purposes not to exceed 90 Calendar days after NTP. It may be summary in nature for the remaining performance period. It must be early start (Start On) and late finish (Finish On or Before) constrained and logically tied as specified in this Section. The Anticipated CPM Schedule forms the basis for the Finalized CPM Schedule specified herein, and must include all of the required Plan and Program preparations, submissions, and approvals identified in the contract (for example, Quality Control Plan, Safety Plan, Environmental Protection Plan, etc.) as well as, if applicable, design activities, the planned submissions of all early design packages, permitting activities, design review conference activities and other non-construction activities intended to occur within the first 90 Calendar days. Schedule any Construction activities planned for the first 90 Calendar days after NTP. AUTHORITY acceptance of the associated design package(s), if applicable, and all other specified Plan and Program approvals that must occur prior to any planned construction activities by CONTRACTOR. The AUTHORITY and CONTRACTOR shall meet to discuss the Anticipated CPM Schedule within 10 working days after its submittal. The CONTRACTOR shall make corrections to the schedule necessary to comply with Contract requirements and shall adjust the schedule to incorporate any missing information requested by the AUTHORITY. The CONTRACTOR shall resubmit the Anticipated CPM Schedule if requested by AUTHORITY.
2. Interim CPM Schedule for Design Build - Submit the Interim CPM Schedule for Design Build projects detailing design and permitting activities, including but not limited to, identification of individual design packages, design submission, reviews and conferences; permit submissions and any required AUTHORITY actions; and long lead item acquisition prior to design completion. As the design proceeds, and design packages are developed, fully detail the remaining construction activities concurrent with the monthly schedule updating process. When the design is

complete, prepare the Finalized CPM Schedule to incorporate into the then approved schedule update all remaining detailed construction activities that are planned to occur. The schedule shall demonstrate a reasonable and realistic sequence of activities which represent all work through the entire contract performance period. The Finalized CPM Schedule shall be at a reasonable level of detail as determined by the AUTHORITY.

3. Finalized CPM Schedule - Submit the Finalized CPM Schedule for approval within 60 Calendar days after NTP. The schedule shall demonstrate a reasonable and realistic sequence of activities which represent all work through the entire contract performance period. In accordance with Section 00 70 00 - General Conditions, the Finalized CPM Schedule shall be submitted prior to the first progress payment. The AUTHORITY's review and approval of the Finalized CPM schedule shall be a prerequisite to the application for the second progress payment. The Finalized CPM Schedule shall be at a reasonable level of detail as determined by the AUTHORITY.
  4. Monthly Updates and Status Reports
  5. Revision, Time Impact Evaluation (TIE), and Recovery Schedules
  6. Record Drawing Schedule
- E. Failure of the CONTRACTOR to meet the requirements of this specification may result in the disapproval of the Anticipated, Interim, Finalized, or Periodic Schedule Updates. In the event that the AUTHORITY directs schedule revisions, and those revisions have not been included in subsequent project schedule revisions or updates, the Contracting Officer may not pay for the applicable activities until such revisions to the project schedule have been made.
- F. Basis for Payment and Cost Loading - Inspections of work progress shall be the basis for determining contract earnings during each update period and therefore the amount of each progress payment. The schedule shall be updated to reflect to outcome of these inspections. Activity cost loading shall be reasonable, as determined by the AUTHORITY. Front loading activities will not be allowed.
- G. Schedules and Reports shall be submitted as specified in Sections 01 32 19, 01 33 00, Submittal Schedule and Submittal Procedures.
- H. CPM Schedule shall be the basis for Two Week Look Ahead Schedule presentation at Weekly Progress Meeting as specified in Section 01 31 19, Project Meetings.

#### **1.04 SCHEDULER QUALIFICATIONS**

- A. Designate an authorized representative to be responsible for the creation and maintenance of the project schedule including all updates, narratives, and reports. The authorized representative shall have 2 years experience scheduling projects similar in nature to this project with scheduling software that meets the requirements of this specification. The resume of the authorized representative detailing the qualifying experience shall be submitted and approved by the AUTHORITY.

## 1.05 SOFTWARE REQUIREMENTS

- A. Development of Schedule, Monthly Payment Requests, Schedule Updates, and Project Status Reporting Requirements of the Contract shall employ computerized Critical Path Method (CPM) scheduling, using Primavera P6 latest release or as approved.

## 1.06 GENERAL REQUIREMENTS

- A. Develop the Project Schedule to an appropriate level of detail, as determined by the AUTHORITY. Failure to develop the Project Schedule to the appropriate level of detail will result in its disapproval. Inaccuracy and/or the omission of any element of the Work by the CONTRACTOR will not relieve the CONTRACTOR of the responsibility for accomplishing the Work, in accordance with Contract Documents. The AUTHORITY's acceptance of the schedule shall be for its use in monitoring and evaluating job progress, payment requests, time extension requests, and the like; and shall not, in any manner, impose a duty of care upon the AUTHORITY; nor act to relieve the CONTRACTOR of its responsibility for the means and methods of construction. The AUTHORITY will consider, but is not limited to, the following characteristics and requirements to determine appropriate level of detail:
  - 1. Activity Durations - Reasonable activity durations are those that allow the progress of ongoing activities to be accurately determined between update periods. No construction activity shall have Original Durations greater than one month's worth of work (20 working days or 30 calendar days).
  - 2. Design and Permit Activities - Include design and permit activities with the necessary conferences and follow-up actions and design package submission dates. Include the design schedule in the project schedule showing the sequence of events involved in carrying out the project design tasks within the specific contract period. This shall be at a detailed level of scheduling sufficient to identify all major design tasks, including those that control the flow of work. The schedule shall include review and correction periods associated with each item.
  - 3. Procurement Activities - Include activities associated with the submittal, approval, procurement, fabrication and delivery; of critical materials, equipment, fabricated assemblies and supplies. This will include all procurement activities that will have a direct impact on construction activities. Additionally, include activities on all long lead materials, equipment, fabricated assemblies and supplies. Long lead procurement activities are those with an anticipated procurement sequence of over 30 calendar days. These activities shall be logically tied to the submission and approval of product info/shop drawings, and the related construction installation activity.
  - 4. Mandatory Task - The following activities shall be included in the initial project schedule and all updates. The CONTRACTOR shall be responsible for all impacts resulting from resubmittal of shop drawings and submittals.
    - a. Submission and approval of design packages, if applicable.
    - b. Submission and approval of SWPPP, if required.
    - c. Long material procurement activities.
    - d. Submission and approval of mechanical and electrical equipment.
    - e. Submission and approval of O&M Manuals.
    - f. Submission and approval of Record drawings.
    - g. Submission of Certificate of Occupancy.

- h. Submission of Spare Parts & Maintenance Materials.
  - i. Submission of Warranties and Bonds.
  - j. Submission of Keys and Keying Schedule.
  - k. Request for Substantial Completion Inspection as specified in 01 77 00 Contract Closeout Procedures.
  - l. Submission and approval of Testing and Air Balance (TAB) results.
  - m. Submission and approval of HVAC commissioning/testing plans and data. (Develop the schedule logic associated with testing and commissioning of mechanical systems to a level of detail consistent with the contract commissioning requirements.)
  - n. Submission and approval of Controls Testing Plan.
  - o. Controls Testing.
  - p. Performance Verification Testing.
  - q. Other systems testing, if required.
  - r. Demonstration and Training
  - s. Final Cleaning.
  - t. Substantial Completion Inspection.
  - u. Substantial Completion.
  - v. Final Completion Inspection.
  - w. Final Completion.
5. AUTHORITY Activities - Show AUTHORITY and other agency activities that could impact progress. These activities include, but are not limited to, AUTHORITY approvals, design reviews, review conferences, release for construction of design package(s), environmental permit approvals by State regulators, inspections, utility tie-ins, AUTHORITY furnished equipment and Notice to Proceed (NTP) for phasing requirements. Unless otherwise agreed upon by CONTRACTOR and AUTHORITY, AUTHORITY approval activities shall be on a 7 day calendar with an Original Duration of 30 days.
6. Work Break-down Structure (WBS) - The project schedule shall be organized using WBS. (This is separate from, and in addition to, the use of Activity Codes; which are addressed below.) The WBS shall include all major elements of the scope of work including, but not limited to, the following elements:
- a. Milestones
  - b. Modifications
  - c. Design
  - d. Submittals
  - e. Approvals
  - f. Procurement
  - g. Construction
  - h. Commissioning/Testing/Start-up
  - i. Close-out Submittals
  - j. Close-out Approvals
  - k. Inspections

7. Activity Coding - All Activity Codes shall be developed and assigned to activities as detailed herein. Some Activity Codes may not be used, but only at AUTHORITY's discretion.

RESP Responsible Party (e.g. Prime CONTRACTOR, Subcontractor, AUTHORITY)  
AREA Area of Work  
PHAS Phase of Work  
MODF Modification to Contract  
CATW Category of Work  
FOW Feature of Work

- a. RESP Responsible Party - Assign responsibility code for all activities to the Prime CONTRACTOR, Subcontractor, or Government agency responsible for performing the activity. The list of activities to be coded with a AUTHORITY Responsibility include, but is not limited to, AUTHORITY approvals, AUTHORITY design reviews, environmental permit approvals by State regulators, AUTHORITY furnished property/equipment, Notice to Proceed (NTP). Code all activities not coded to the AUTHORITY to the Prime CONTRACTOR or Subcontractor responsible to perform the work. Activities shall not have more than one Responsibility Code. Codes should be descriptive of the scope of work, for example DSGN (for designer of record), ELEC (for electrical Subcontractor), MECH (for mechanical Subcontractor), PRIM for Prime CONTRACTOR, and DEPT (for AUTHORITY activities).
- b. AREA Area of Work - Assign Work Area code to activities based upon the work area in which the activity occurs. Define work areas based upon resource constraints or space constraints that would preclude a resource, such as a particular trade or craft work crew from working in more than one work area at a time due to restraints on resources or space. Examples of Work Area Coding include different areas within a floor of a building, different floors within a building, and different buildings within a complex of buildings. Activities shall not have more than one Work Area Code. Not all activities are required to be Work Area coded. A lack of Work Area coding will indicate the work area is not resource or space constrained.
- c. PHAS Phase of Work Coding - Assign Phase of Work code to all construction activities if the contract specifies phasing with separately defined performance periods. Identify a Phase Code to allow filtering and organizing the schedule accordingly. Each activity shall have only one Phase of Work code.
- d. MODF Modification of Contract - Assign a Modification of Contract code to any activity or sequence of activities added to the schedule as a result of a Contract Modification, after approval by AUTHORITY. An activity can have only one Modification of Contract code.
- e. CATW Category of Work - Assign a Category of Work code to all activities. Category of Work codes include, but are not limited to, milestone, design submittal, design approval, design review conference, submittal, approval, procurement, permit, installation, weather sensitive installation, commissioning/testing, inspection, contract requirement. Each activity shall have only one Category of Work Code.

- f. FOW Feature of Work - Assign a Feature of Work code to all construction activities based upon the definable feature of work to which the activity belongs. Use the Specification numbering system for the Code Value.
8. Contract Constraints and Milestones - The CONTRACTOR shall follow the parameters as specified herein for all schedules.
- a. Constraints - The schedule shall have no constrained dates other than those specified herein. Additional constraints may be approved by the AUTHORITY on a case by case basis. The use of artificial float constraints, such as 'zero free float' or 'zero total float,' are prohibited. Additionally, Mandatory Start, Mandatory Finish, Finish On, and As Late As Possible constraints are prohibited.
    - i. Project Start Date Constraint - The first activity in the project schedule shall have a Start On constraint equal to the date that the NTP was acknowledged.
    - ii. Substantial Completion Constraint - The Substantial Completion activity shall have a Finish On or Before constraint equal to the contractual Substantial Completion Date.
  - b. Milestones - Use of milestone activities shall be held to a minimum. Milestone activities may be used for significant project events including, but not limited to, project phasing, project start and end activities, or interim completion dates. The following are required Milestone activities:
    - i. Project Start Date Milestone - The first activity in the project schedule shall be a Start Milestone titled 'Start Project (NTP).'
    - ii. Substantial Completion Milestone - The Substantial Completion activity shall be a Finish Milestone titled 'Substantial Completion DD-MMM-YY.'
    - If the schedule calculates an early finish, then the float calculation for the 'Substantial Completion DD-MMM-YY' milestone shall reflect positive float on the longest path of logic. If the project schedule calculates a late finish, then the 'Substantial Completion DD-MMM-YY' milestone float calculation shall reflect negative float on the longest path. The AUTHORITY is under no obligation to accelerate AUTHORITY activities to support CONTRACTOR's early completion. The AUTHORITY may reject an earlier (advanced) schedule, i.e. one that shows early completion dates for the Contract Milestones.
    - iii. Final Completion Milestone - The last activity in the schedule shall be a Finish Milestone titled 'Final Completion.'
9. The CONTRACTOR shall not be entitled to extra compensation in the event that a schedule is approved showing an earlier completion than is contractually required; but then completes the project, for whatever reason, beyond the completion date shown in the earlier approved schedule; but within the Contract performance period.
10. Ownership of Float - Float available in the schedule, at any time, shall not be considered for the exclusive use of either the AUTHORITY, or the CONTRACTOR. This includes Activity Float and Project Float. Activity Float is the length of time that



- an activity can be delayed without causing a delay to the 'End Project (CCD)' finish milestone. Project Float is the length of time between the CONTRACTOR's projected early finish and the Contract Completion Date milestone.
11. Calendars - Activities will be assigned a Project Specific Calendar to which the activity logically belongs. Calendars should be developed to accommodate any contract defined work period such as a '7-day no holidays' calendar for AUTHORITY approval periods, concrete cure times, etc. The Default Calendar on the Project Level should be developed to include weekends and holidays. At a minimum, there should be both '7-day no holidays' and a '5-day w/ holidays' Project Specific calendars. For projects that include activities that are affected by adverse weather, an additional Project Specific calendar that includes weekends and holidays, as applicable, should be developed that blocks out the Winter Shut-down period as non-work days. When setting up the Project Specific calendars, with the 'Detailed work hours/day' radio button checked, click on the Workweek button on the bottom right hand side. Set the Standard work hours to be from 0800 to 1600 with no 'lunch' break blocked out. (Elsewhere in this specification, the required project administrative parameters set a 'day' as equivalent to 8 hours. For the purposes of establishing Original Durations, a day is a day. Even if CONTRACTOR intends to work 10 hrs/day or 12 hrs/day, to accurately calculate progress, the Calendars must match the 8 hrs/day setting. )
  12. Open Ended Logic - There shall be only two open ended activities; the first activity 'Start Project (NTP)' shall have no Predecessor logic, and the last activity "Final Completion' shall have no Successor logic. Predecessor open ended logic may be allowed in time impact analyses, upon the AUTHORITY's approval.
  13. Default Progress Data Disallowed - Actual Start and Finish dates shall not automatically update with default mechanisms included in the scheduling software. Updating of the percent complete and the remaining duration of any activity shall be independent functions. Program features that calculate one of these parameters from the other shall be disabled. Activity Actual Start (AS) and Actual Finish (AF) dates assigned during the updating process shall match those dates provided in the CONTRACTOR Quality Control Reports. Failure of the CONTRACTOR to document the AS and AF dates in the Daily Quality Control report shall result in disapproval of the CONTRACTOR's schedule.
  14. Out-of Sequence Progress - Activities that have progressed before all preceding logic has been satisfied (Out-of-Sequence progress) are not allowed. Logic must be corrected (e.g. changing the relationship from FS to SS to match actual field conditions) so that the error log is clear of any Out-of-Sequence logic.
  15. Original Duration - Activity Original Duration (OD) changes are prohibited unless approved by AUTHORITY. Remaining duration shall be used to make activity duration changes, after an activity has started, when progressing the project schedule.
  16. Negative Lags and Start to Finish (SF) Relationships - Lag durations contained in the project schedule shall not have a negative value under any circumstances. Start to Finish (SF) relationships are prohibited.
  17. Retained Logic - Schedule calculations shall retain the logic between predecessors and successors ('Retained Logic' mode) even when the successor activity has started and the predecessor activity has not yet finished (Out-of-Sequence logic). Software features that in effect sever the tie between predecessor and successor

activities when the successor has started and the predecessor logic is not satisfied (“Progress Override”) is not allowed.

**B. COST LOADING THE SCHEDULE**

1. After the schedule has been approved by AUTHORITY, create and submit a Schedule of Values (SOV) spreadsheet to cost load each pay activity. The SOV spreadsheet should include the same WBS structure as the approved schedule for ease of reference. Each pay activity should be categorized under the appropriate WBS. Create a Row below the Column Header Row that provides totals for each cost column. The page header shall include the Project Number, Project Name, Date, Pay Application Number, and Project Total Cost or GMP amount. Include the following columns:
  - a. Activity ID
  - b. Activity Name
  - c. Budgeted Total Cost
  - d. Previous Billings
  - e. Current Month Billing
  - f. Remaining Total Cost
  - g. Percent Complete
2. For CM/GC projects, Include an activity labeled ‘General Conditions.’ Assign the activity a Budgeted Total Cost equivalent to the currently approved NTE amount for reimbursable expenses. Do not assign a value to any other General Conditions activities such as Mobilization, Submittal Preparation, etc.
3. Each month include on the Narrative Report a list of activities that have had a Budgeted Cost change, including all added and deleted activities, with an explanation each change. Any change to the SOV must be approved by the AUTHORITY.
4. For Procurement activities, only actual procurement costs are billable. Do not include any profit, overhead, or any other form of markup.
5. The Anticipated CPM and Interim CPM schedules shall be based upon a Schedule of Values approved by the AUTHORITY, and will be used as basis for monthly progress payments until approval of the Finalized CPM Schedule.
6. The value assigned to each activity shall be an accurate representation of the total cost to perform each activity; including the total for labor, material (unless a separate procurement activity exists), and equipment costs. Front loading the schedule in any way is prohibited. The sum of all tasks shall equal the total Contract price.
7. The SOV spreadsheet must be approved by AUTHORITY prior to submittal of any pay applications.
8. To allow for proper schedule management, cost load the correction of punch list from AUTHORITY Substantial Completion Inspection activity not less than 1 percent of the total contract value.

**C. PROGRESSING THE SCHEDULE**

1. Percent Complete – CONTRACTOR and AUTHORITY shall on a monthly basis review project progress and establish the approved percent complete for each activity started, based upon the realistic assessment of earned value.

CONTRACTOR will then update the schedule with Actual Start, Actual Finish, Percent Complete, and Remaining Duration. Activities which are complete but for remaining minor punch list work, and which do not restrain the initiation of successor activities, may be declared 100 percent complete. The Substantial Completion Inspection activity may be declared 100 percent complete upon completion and correction of all punch list work identified during AUTHORITY Substantial Completion Inspection(s).

2. Remaining Duration - Update the Remaining Duration on any activity that has started but is not yet finished. Remaining Duration should be a realistic assessment of the amount of days remaining to complete that activity.
- D. PROJECT SCHEDULE SUBMISSIONS - Provide the submissions as described below. The data CD, reports, and Network Diagrams required for each submission are contained in paragraph 5.4.2.
1. Periodic Schedule Updates
    - a. The CONTRACTOR shall update the project schedule on a monthly basis. The updated project schedule shall be submitted to the AUTHORITY for approval at the periodic schedule update meetings as prescribed in paragraph 5.4.3. These submissions will enable the AUTHORITY to assess CONTRACTOR's progress. If the CONTRACTOR fails or refuses to furnish the information and schedule updates as set forth herein, then the CONTRACTOR shall be deemed not to have provided an estimate upon which a progress payment can be made. For Design-Build projects, update the schedule to include detailed construction activities as the design progresses, but not later than the submission of the final, un-reviewed design submission for each separate design package. The Contracting Officer may require submission of detailed schedule activities for any distinct construction that is started prior to submission of a final design submission, if such activity is authorized.
    - b. Neither updating, changing or revising of any report, curve, schedule or narrative submitted to the AUTHORITY by the CONTRACTOR under this Contract, nor the AUTHORITY's review or acceptance of any such report, curve, schedule or narrative shall have the effect of amending or modifying, in any way, the Contract Substantial Completion date or milestone dates or of modifying or limiting, in any way, the CONTRACTOR's obligations under this Contract.
  2. Submittal Requirements - Each submittal shall have as its face document a completed AUTHORITY-furnished submittal summary form. Submittals received from sources other than the CONTRACTOR will be returned to the CONTRACTOR without the AUTHORITY's review. Submit the following items for the Anticipated CPM, Interim CPM, Finalized CPM, and every Periodic Schedule Update throughout the life of the project:
    - a. Data CDs - Provide two sets of data CDs or DVDs containing the current project schedule and all previously submitted schedules in the format of the scheduling software (i.e. .xer). Also, include on the data CDs the Narrative Report, Network Diagram Report, SOV spreadsheet, and all required

- Schedule Reports. Label each CD indicating the type of schedule (Anticipated, Interim, Finalized, Update #), full project number, Data Date, Submittal Number and file name. Each schedule shall have a unique file name and use project specific settings.
- b. Narrative Report - Provide a Narrative Report with each schedule submission. The narrative report is expected to communicate to the AUTHORITY the CONTRACTOR's thorough analysis of the schedule output and its plans to compensate for any problems, either current or potential, which are revealed through that analysis. Two hard copies of the Narrative Report shall accompany the submittal package. The Narrative Report shall include the following information as a minimum:
    - i. Project number, Date, Data Date, File Name, Update Number
    - ii. Critical Path - Show all activities on the critical path. The critical path is defined as the longest path of logic.
    - iii. Added Activities - Include Activity ID, Activity Name, Original Duration, Calendar, Predecessor(s), Successor(s), AREA, PHAS, CATW, FOW, and MODF codes.
    - iv. Deleted Activities
    - v. Duration Changes
    - vi. Calendar Changes
    - vii. Logic Changes
    - viii. SOV Changes
    - ix. Current and Anticipated Delays - Include a description of current and anticipated problem areas or delaying factors and their impacts, whether it/they are the responsibility of the AUTHORITY or CONTRACTOR, and an explanation of corrective actions taken or required to be taken.
    - x. Scheduler Comments - Explain in narrative form, anything the AUTHORITY should know or understand as to the reasons for the changes contained herein.
  - c. Schedule Log Report - Schedule the Project (F9, Enter), Press F9 again and then click Schedule Log. Print Report and submit with schedule updates.

Note: The only activity allowed to not contain a Predecessor is the Start Project (NTP) activity. The only activity allowed to not contain a Successor is the Finish Project (CCD) activity. There are to be no Out-of-Sequence activities, no activities with Actual Dates > the Data Date, and no activities with invalid relationships.
  - d. Network Diagram Report - The network diagram report is required for the Anticipated, Interim, Finalized, and all Periodic Updates. Two 11"x17" color hard copies of the Network Diagram Report shall accompany the data CDs. Include the following columns:
    - i. Activity ID
    - ii. Activity Name
    - iii. Original Duration
    - iv. Remaining Duration

- v. Start
  - vi. Late Start
  - vii. Finish
  - viii. Late Finish
  - ix. Percent Complete
  - x. Total Float
- e. SOV Spreadsheet - The SOV Spreadsheet as detailed in Section 5.2, should be updated on a monthly basis to reflect accurate Previous Billings, Current Billing, Remaining Total Cost, and Percent Complete values. Two hard copies, with all columns formatted to fit on a single page, shall be included with the submittal package.
3. Periodic Schedule Update Meetings - Conduct periodic schedule update meetings for the purpose of reviewing the CONTRACTOR's proposed Periodic Schedule Update, Narrative Report, Schedule Reports, and progress payment. Meetings shall occur at least monthly within five days of the proposed schedule Data Date. The CONTRACTOR shall provide a computer with the scheduling software loaded on the computer and a projector, which allows all meeting participants to view the proposed schedule during the meeting. The CONTRACTOR's scheduler will be available during the meeting to organize, group, sort, and filter the schedule as requested by the AUTHORITY. An electronic version of the proposed schedule update, narrative, and all reports will be provided at least 48 hours in advance of the meeting. The CONTRACTOR's Project Manager, superintendent, foreman, and major Subcontractors shall attend the meeting as required to discuss the project schedule and work. CONTRACTOR will present the current status of the project and will review the narrative report. Following the Periodic Schedule Update Meeting, the CONTRACTOR shall make corrections to its draft submission. Only those changes approved by the AUTHORITY will be included in the submission and invoice for payment.
4. Update Submission Following Progress Meeting - Submit a complete update of the project schedule containing all approved progress, revisions, and adjustments; pursuant to paragraph SUBMISSION REQUIREMENTS not later than 4 working days after the Periodic Schedule Update meeting.

**E. REQUESTS FOR TIME EXTENSIONS**

Provide a justification of delay to the Contracting Officer in accordance with the contract provisions and clauses for approval within 10 days of a delay occurring. The CONTRACTOR shall also prepare a Time Impact Evaluation (TIE) for each AUTHORITY request for proposal (RFP) to justify time extensions.

1. Justification of Delay - The CONTRACTOR shall provide a description of the event(s) that caused the delay and/or impact to the CONTRACTOR's work. As part of the description, the CONTRACTOR must identify all schedule activities that were impacted. The CONTRACTOR must show the event that caused the delay/impact was the responsibility of the AUTHORITY. The CONTRACTOR shall also provide a Time Impact Evaluation (TIE) that demonstrates the effects of the delay or impact on

- the project completion date or interim completion date(s). Multiple impacts shall be evaluated chronologically; each with its own justification of delay. The sum of all delays shall be cumulative. A time extension and the schedule fragnet shall become part of the project schedule and all future schedule updates upon approval by the Contracting Officer.
2. Time Impact Evaluation (TIE) - The CONTRACTOR shall prepare a time impact evaluation for approval by the AUTHORITY. The CONTRACTOR shall utilize a copy of the last approved schedule prior to the first day of the impact or delay for the time impact analysis. If AUTHORITY determines the time frame between the last approved schedule and the first day of impact is too great, the CONTRACTOR shall prepare an interim updated schedule to perform the time impact evaluation. Unless approved by the AUTHORITY, no other changes will be incorporated into the schedule being used to justify the time impact. Pending change orders shall not be incorporated into the schedule unless the TIE has been approved by the AUTHORITY.
  3. Fragmentary Network (Fragnet) - The CONTRACTOR shall prepare a proposed fragnet for its time impact evaluation. The proposed fragnet shall consist of a sequence of new activities that are proposed to be added to project schedule to demonstrate the influence of the delay or impact to the project's contractual dates. The CONTRACTOR shall clearly show how the proposed fragnet is to be tied into the project schedule including all predecessors and successors to the fragnet activities. The proposed fragnet shall be approved by the AUTHORITY prior to incorporation into the project schedule.
  4. Time Extension - The Contracting Officer must approve the CONTRACTOR's justification of Delay including the time impact evaluation before a time extension will be granted. The time extension shall be given in calendar days. No time shall be granted under this Contract for cumulative effect of changes.
  5. Recovery Plan - Should the CONTRACTOR's progress fall behind the approved project schedule for reasons other than those that are excusable within the terms of the contract, the AUTHORITY may require the CONTRACTOR to provide a written recovery plan to AUTHORITY for approval. The plan shall detail how progress will be made-up to include which activities will be accelerated by adding additional crews, longer work hours, extra work days, etc.
  6. Artificially Improving Progress - The CONTRACTOR shall not artificially improve progress by simply revising the schedule logic, modifying or adding constraints, shortening activity durations, or changing calendars in the project schedule. The CONTRACTOR shall indicate assumptions made and the basis for any logic, constraint, duration and calendar changes used in the creation of the recovery plan. Any additional resources, manpower, or daily and weekly work hour changes proposed in the recovery plan must be evident at the work site and documented in the CONTRACTOR's daily report.
  7. Failure to Perform - Failure to perform work and maintain progress in accordance with the supplemental recovery plan, may result in an interim and final unsatisfactory performance rating and/or may result in corrective action by the AUTHORITY in accordance with the contract provisions.
  8. The CONTRACTOR shall be responsible for all costs associated with the preparation of Time Impact Evaluations, and the process of incorporating them into the current

schedule update. The CONTRACTOR shall provide the AUTHORITY four (4) copies of each TIE.

- F. WEEKLY PROGRESS MEETINGS - The CONTRACTOR shall meet weekly with the AUTHORITY (or as otherwise mutually agreed to) between the meetings described in paragraph PERIODIC SCHEDULE UPDATE MEETINGS for the purpose of jointly reviewing the actual progress of the project as compared to the as planned progress, and to review planned activities for the upcoming two weeks. The current approved schedule update shall be used for the purposes of this meeting and for the production and review of reports. The weekly progress meeting will address the status of RFI's, RFP's and Submittals. CONTRACTOR shall provide and present a time scaled two-week look ahead schedule that is based and correlated to the current CPM schedule. The schedule shall look out two weeks from the day of the Weekly Progress Meeting.
- G. PRIMAVERA P6 MANDATORY REQUIREMENTS - The following settings are mandatory and required in Anticipated, Interim, and Finalized CPM schedule submissions to the AUTHORITY.
1. Activity Codes shall be Project Level not Global or EPS level.
  2. Calendars shall be Project Level not Global or Resource level.
  3. Activity Duration Types must be set to "Fixed Duration & Units". (note: Milestones default to Fixed Duration & Units/Time)
  4. Percent Complete Types must be set to "Physical".
  5. Time Period Admin Preferences must remain the default "8.0 hr/day, 40 hr/week, 172 hr/month, 2000 hr/year". Calendar Work Hours/Day must be set to 8.0 Hour days.
  6. Schedule Option for defining Critical Activities shall be set to "Longest Path".
  7. Schedule Option for defining progressed activities shall be set to "Retained Logic".
  8. Activity ID's shall not exceed 10 characters.
  9. Activity Names shall have the most defining and detailed description within the first 30 characters.
- H. SUBCONTRACTOR AGREEMENT - Submit for each Subcontractor and supplier on their corporate letterhead, a statement certifying that the Subcontractor or supplier accepts the CONTRACTOR's Finalized CPM Schedule, and that the Subcontractors' or suppliers' related schedules have been properly incorporated. Include with the certification a copy of each Subcontractors' or suppliers' schedules upon which the proposed Finalized CPM Schedule was built. The certification statements shall confirm that task durations, cost and resource loading variables have been correctly included in the Finalized CPM schedule. Failure to provide Subcontractor agreements may result in denial of the project schedule submission.
- I. DAILY CONSTRUCTION REPORTS - The CONTRACTOR shall, on a daily basis, submit a daily task report to the AUTHORITY for each working day, including weekends and holidays, when worked. The CONTRACTOR shall develop the daily construction reports on a computer-generated database capable of sorting daily Work, manpower and labor hours by the CONTRACTOR, Subcontractor, area, and Change Order. Upon request of the AUTHORITY, the CONTRACTOR shall furnish computer disk of this database. The CONTRACTOR shall obtain the AUTHORITY's written approval of database format for daily construction reports prior to implementation. The following shall be included in report:

1. Project name and Project number
2. CONTRACTOR's name and address
3. Weather, temperature and any unusual site conditions.
4. Was this day adversely affected by the weather?
5. Brief description and location of the day's scheduled activities and any special problems and accidents, including Work implemented by Subcontractors.
6. Activities Started today.
7. Activities Completed today.
8. Worker quantities for prime and for Subcontractors of any tier. Include the trade of the worker, ie. Superintendent, Quality Control, Electrician, Operator, etc., and number of hours worked.
9. Equipment, other than hand tools, utilized by CONTRACTOR and Subcontractors. Include equipment identification, number of hours in service and number of hours idle. Include any equipment inspections and equipment maintenance performed, if any.

**PART 2 – PRODUCTS**

**Not Used**

**PART 3 – EXECUTION**

**Not Used**

**END OF SECTION**



**SECTION 01 33 00  
SUBMITTAL PROCEDURES**

**PART 1 – GENERAL**

**1.01 SECTION INCLUDES**

- A. Procedures for the preparation, tracking, and review of submittals for the project.

**1.02 RELATED REQUIREMENTS**

- A. Section 00 70 00 – General Requirements
- B. Section 00 80 00 – Supplementary Conditions
- C. Section 01 11 13 - Summary of Work: Work sequence
- D. Section 01 12 19 – Subcontractor Certifications
- E. Section 01 29 73 - Schedule of Values: Submittal of Schedule of Values
- F. Section 01 29 76 - Applications for Payment: Submittal of Applications
- G. Section 01 31 13 – Job Site Administration
- H. Section 01 32 00 – Work Schedules and Reports
- I. Section 01 33 23 – Shop Drawings Product Data and Samples.
- J. Section 01 45 00 - Quality Control: Manufacturers' field service reports, Testing laboratory reports
- K. Section 01 45 29 – Testing Laboratory Services
- L. Section 01 60 00 - Material and Equipment: Substitutions
- M. Section 01 71 23 – Field Engineering
- N. Section 01 73 00 – Execution Requirements: Project Record Documents, Warranties and Bonds: Closeout submittals
- O. Section 01 77 00 - Contract Closeout Procedures: Closeout submittals
- P. Technical Product Specifications
- Q. Commissioning Specifications
- R. Operations and Maintenance Manuals
- S. Equipment Installation Data

**1.03 SCHEDULE OF SUBMITTALS**

- A. Submit preliminary Schedule of Submittals as required by Section 00 70 00 - General Conditions. In addition to shop drawing submissions, include all submittals required by the Contract Documents in the Schedule of Submittals.
- B. Schedule of Submittals will be used by the AUTHORITY to schedule time in their activities relating to review of submittals. Schedule of Submittals shall portray an orderly sequence of submittals, early submittals for long lead-time items, and submittals which require extensive review.
- C. Schedule of Submittals shall be reviewed by the AUTHORITY and shall be revised and resubmitted until accepted by the AUTHORITY.

**1.04 CONTRACTOR REVIEW**

- A. The CONTRACTOR shall prepare and review submittals as required by the provisions of Section 00 70 00 – General Conditions and Section 00 80 00 – Supplementary Conditions.

**1.05 SUBMITTAL REQUIREMENTS**

- A. Number of copies: Submit the number of copies of submittals which the CONTRACTOR requires to be returned to it following review, plus four (4) copies for retention by the AUTHORITY. Electronic submittals are accepted by the AUTHORITY.
- B. Submit each submittal with a Submittal Summary form as its face document. Use a Submittal Summary form provided by the AUTHORITY, or a substitute approved by the AUTHORITY.
- C. Label submittals with a numbering system approved by the AUTHORITY. Identify the project by title and AUTHORITY'S project number; identify Work and product by Specification section and Article number.
- D. Submit items required by individual specification sections. Sequence the submission of submittals to correspond with the approved Schedule of Submittals.
- E. Before the submission of each submittal, the CONTRACTOR shall have determined and verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar data with respect thereto and reviewed or coordinated each submittal with other submittals and with the requirements of the Work and the Contract Documents, upon which the CONTRACTOR shall certify in writing on each submittal that it has made this determination. The failure to review and certify a submittal shall be cause for the AUTHORITY to return the submittal without review.
- F. On the submittal, notify the AUTHORITY in writing of any deviations from requirements of the Contract Documents.
- G. Organize the submittals into logical groupings to facilitate the processing of related submittals, such as:
  - 1. Finishes which involve AUTHORITY selection of colors, textures, or patterns.
  - 2. Items required by the individual Technical Product Specification Sections.

- 3. Associated items, which require correlation for efficient function or for installation.
- H. Submit all required color and finish samples in order to receive approval for colors and finishes.

**1.06 RESUBMITTALS**

- A. Provide the same number of submittals required for the first submission. For example, if 6 are required and 2 are returned marked “rejected” or “revise and resubmit”, re-submit 6 copies. The AUTHORITY will not return any of its copies from the prior submittal for the CONTRACTOR’S use in preparing the re-submittal.
- B. Provide complete copies of re-submittals. Do not re-submit partial copies of submittals for incorporation into the AUTHORITY’S retained submittals from the prior submission.
- C. If drawings, product submittals, samples, mockups, or other required submittals are incomplete or not properly submitted, the AUTHORITY will not review the submittal and will return it to the CONTRACTOR. The AUTHORITY will review a submittal no more than 2 times without additional charge to the CONTRACTOR (incomplete or improperly submitted submittals count as one). The CONTRACTOR shall pay all review costs associated with more than 2 reviews.

**1.07 AUTHORITY REVIEW**

- A. The AUTHORITY will review submittals and re-submittals, and return submittal comments within 30 calendar days of receipt.
- B. The AUTHORITY or authorized agent will receive, review and return submittals to the CONTRACTOR with one of the following dispositions noted:

“No Exceptions Taken” – denotes that the submittal is generally consistent with the requirements of the Contract Documents. A resubmittal is not required.

“Make Corrections Noted” – denotes that the submittal is generally consistent with the requirements of the Contract Documents but only as conditioned by notes and corrections made on the submittal. A resubmittal is not required provided the CONTRACTOR understands the review comments and desires no further clarification.

“Revise and Resubmit” – denotes that revisions are required in the submittal in order for the submittal to be generally consistent with the requirements of the Contract Documents. The AUTHORITY will indicate on the returned submittal what revisions are necessary. A resubmittal is required.

“Rejected” – denotes that the submittal does not meet the requirements of the Contract Documents and shall not be used in the Work. The AUTHORITY will indicate on the returned submittal the reasons for its rejection. A resubmittal is required.

- A. Review by the AUTHORITY of submittals shall not be construed as a complete check, but will indicate only that the general method of construction and detailing is consistent with the requirements of the Contract Documents. Review of submittals shall not relieve the

CONTRACTOR of the responsibility for compliance with the requirements of the Contract Documents or for errors, dimensions, and quantities unless specific exception is requested and approved on the submittal.

- B. The AUTHORITY's review shall not extend to the means, methods, techniques, sequences or procedures of construction or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

**1.08 DISTRIBUTION**

- A. The CONTRACTOR shall be responsible for making and distributing any reproductions of approved submittals that it may require for its use.
- B. The CONTRACTOR shall perform work in accordance with approved submittals.

**PART 2 – PRODUCTS**

**Not Used**

**PART 3 – EXECUTION**

**Not Used**

**END OF SECTION**

**SECTION 01 33 23**

**SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES**

**PART 1 - GENERAL**

**1.01 RELATED REQUIREMENTS**

- A. Section 00 70 00 - General Conditions
- B. Section 01 11 13 - Summary of Work
- C. Section 01 31 19 – Project Meetings
- D. Section 01 33 00 - Submittals: Schedules for submittals and submittal requirements
- E. Section 01 45 00 - Quality Control: Mockups and samples for testing
- F. Section 01 60 00 - Material and Equipment
- G. Section 01 73 00 - Execution Requirements
- H. Section 01 78 39 – Project Record Documents
- I. Technical Specifications: Identification of submittal requirements

**1.02 SHOP DRAWINGS**

- A. Present in a clear and thorough manner. Label each Shop Drawing with AUTHORITY's Project name, Project number and date of submittal. Identify each element of the Shop Drawings by reference to specification section, sheet number and detail, schedule, or room number of Contract Documents.
- B. The data shown on the Shop Drawings shall be complete with respect to specified performance and design criteria, materials and similar data to show the AUTHORITY materials and equipment the CONTRACTOR proposes to provide.
- C. Identify dimensions; show relation to adjacent or critical features or Work or products.
- D. Designation of work "by others," if shown in submittals, shall mean that work will be responsibility of CONTRACTOR rather than subcontractor or supplier who has prepared submittals.
- E. Minimum Sheet Size: 11"x17".

**1.03 PRODUCT DATA**

- A. Submit only pages which are pertinent; mark each copy of standard printed data to identify pertinent products, referenced to Specification section and Article number. Show reference standards, performance characteristics and capacities; wiring and piping diagrams and controls; component parts; finishes; dimensions; and required clearances.

- B. Modify manufacturer's standard schematic drawings and diagrams to supplement standard information and to provide information specifically applicable to the Work. Delete information not applicable.
- C. Submit manufacturer's instructions for storage, preparation, assembly, installation, start-up, adjusting, balancing, and finishing.

**1.04 SAMPLES**

- A. Submit full range of manufacturer's standard finishes except when more restrictive requirements are specified, indicating colors, textures and patterns, for AUTHORITY selection as specified in technical product sections.
- B. Submit samples to illustrate functional characteristics of products, including parts and attachments.
- C. Approved samples, which may be used in the Work, are indicated in the Specification section.
- D. Samples shall be identified clearly as to material, supplier, pertinent data such as catalog numbers and the use for which they are intended and otherwise as the AUTHORITY may require, to enable the AUTHORITY to review the submittal.
- E. Label each sample with identification required for transmittal letter.
- F. Provide field sample mockup of finishes at Project, at location acceptable to AUTHORITY, as required by individual Specification section. Install each sample complete and finished. Acceptable finishes in place may be retained in completed Work.

**PART 2 – PRODUCTS**

**Not Used**

**PART 3 - EXECUTION**

**Not Used**

**END OF SECTION**

**SECTION 01 41 00  
SPECIAL REGULATORY REQUIREMENTS**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Compliance with Governmental Regulatory Permit requirements and conditions.

**1.02 RELATED REQUIREMENTS**

- A. Section 00 70 00 - General Conditions

**1.03 SPECIAL REGULATORY REQUIREMENTS**

- A. The CONTRACTOR shall comply with all the requirements enumerated in the Contract Documents. In addition, the CONTRACTOR shall comply with the following codes and permits, as amended by the Authority Having Jurisdiction, if required.
  - 1. Current Edition of the International Building Code
  - 2. Current Edition of the International Fire Code
  - 3. Current edition of Uniform Plumbing Code
  - 4. Current edition of International Mechanical Code
  - 5. Current edition of NFPA 70 National Electric Code
  - 6. Current edition of IEEE National Electrical Safety Code (NESC)
  - 7. Current Edition of Americans with Disability Act Guidelines
  - 8. Current edition of Occupational safety and Health Administration standards
  - 9. NFPA 101 – Life Safety Code
  - 10. ASCE 7-05
  - 11. Required Permits of the Authority Having Jurisdiction
  - 12. Environmental Protection Agency (EPA), Section 402/40 CFR 125, National Pollutant Discharge Elimination System (NPDES) Nationwide Permit Compliance, with compliance with all permit requirements; Storm Water Pollution Prevention (SWPP) Plan, Notice of Intent (NOI), and Notice of Termination (NOT), if required.

**PART 2 – PRODUCTS NOT USED**

**PART 3 – EXECUTION NOT USED**

**END OF SECTION**

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**SECTION 01 42 19  
REFERENCE STANDARDS**

**PART 1 - GENERAL**

**1.01 RELATED SECTIONS**

- A. Section 00 70 00 - General Conditions

**1.02 QUALITY ASSURANCE**

- A. For Products or workmanship specified by association, trade, or other technical standards: comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date of bid advertisement, unless otherwise stated in the Contract Documents.
- C. Provide copies of standards through the submittal process when required by the Contract Documents. Maintain a copy of each reference standard on site during construction.
- D. Should specified reference standards conflict with Contract Documents, request clarification from the AUTHORITY before proceeding. Local code requirements, where more stringent than referenced standards, shall govern.
- E. Neither the contractual relationship, duties, and responsibilities of the parties to the Contract, nor those of the Architect/Engineer, shall be altered by the Contract Documents by mention or inference otherwise in any reference document.

**PART 2 - PRODUCTS**

**Not Used**

**PART 3 - EXECUTION**

**Not Used**

**END OF SECTION**

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**SECTION 01 45 00  
QUALITY CONTROL**

**PART 1 – GENERAL**

**1.01 SECTION INCLUDES**

- A. Quality Control program requirements
- B. Manufacturer field services requirements
- C. Testing laboratory requirements
- D. Record keeping for quality control
- E. Quality surveillance by AUTHORITY

**1.02 RELATED SECTIONS**

- A. Section 00 70 00 - General Conditions
- B. Section 01 29 76 – Application for Payment
- C. Section 01 31 19 – Project Meetings
- D. Section 01 33 00 – Submittal Schedule, Submittal Procedures
- E. Section 01 33 23 – Shop Drawings, Product Data, and Samples
- F. Section 01 42 19 – Reference Standards
- G. Section 01 45 23 – Authority Inspection Service
- H. Section 01 45 29 – Testing Laboratory Services
- I. Section 01 60 00 – Material and Equipment
- J. Section 01 77 00 – Contract Closeout
- K. Individual Specification Sections: Quality Control

**1.03 REFERENCES**

- A. Comply with Section 01 42 19 – Reference Standards and the individual technical product specification sections.

**1.04 DESCRIPTION**

- A. The CONTRACTOR shall provide and maintain an effective Quality Control Program related to testing and inspection. The CONTRACTOR shall perform Quality Control Testing as

specified and shall provide copies of all results to the AUTHORITY for use in observing contract compliance.

- B. The CONTRACTOR's Quality Control Program shall include, but is not limited to: administration, management, supervision, reports, record-keeping, submittals, services of independent testing agencies and labs, and other related services.
- C. Quality Control is the sole responsibility of the CONTRACTOR.
- D. The CONTRACTOR's Quality Control program does not include I.B.C. required special inspection performed by the AUTHORITY as described in Section 01 45 23 – AUTHORITY Inspection Service.
- E. Quality Control services are required to verify compliance with requirements specified or indicated and do not relieve the CONTRACTOR of responsibility for compliance with the Contract Documents.
- F. Specific Quality Control requirements for individual construction fabrication and procurement activities are included in the Technical Product Specifications. General Quality Control requirements entail ensuring that all aspects of the Work conform to the technical requirements of the Contract Documents.
- G. The CONTRACTOR's Quality Control Program described herein is not intended to limit the CONTRACTOR's Quality Control activities, which may be necessary to achieve compliance with the Contract Documents.
- H. The CONTRACTOR shall have a full-time Quality Control Manager whose sole responsibility is to ensure compliance with Contract Documents and manage the CONTRACTOR Quality Control Program, except that the Quality Control Manager may also serve as the site safety officer.

#### **1.05 JOB CONDITIONS**

- A. Where Specifications require work to be field-tested or approved, it shall be tested in the presence of the AUTHORITY after timely notice of its readiness for inspection and testing, and the work after testing shall be concealed only upon approval of AUTHORITY.
- B. The AUTHORITY shall have the right to witness all off site tests. The CONTRACTOR shall notify the AUTHORITY at least seven (7) calendar days prior to testing.
- C. The results of tests are for use by the AUTHORITY to evaluate the acceptability of materials with respect to specified testing requirements. Regardless of the test results, CONTRACTOR is solely responsible for quality of workmanship and materials and for compliance with requirements of Contract Documents.
- D. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship to produce work of specified quality. Verify applicability and follow all manufacturers' recommendations and instructions for assembly, installation and testing of materials and equipment. In any case where the CONTRACTOR believes that such recommendations or instructions are not applicable, the CONTRACTOR shall so notify the

AUTHORITY and state the reasons for the CONTRACTOR's determination. The CONTRACTOR shall then follow the AUTHORITY's written direction on whether to follow manufacturer's recommendations and instructions.

- E. Upon failure of materials and equipment, which have been tested or inspected, previous acceptance may be withdrawn and material may be subject to removal and replacement with material meeting Specification requirements, at no cost to the AUTHORITY.

**1.06 MANUFACTURER'S FIELD SERVICES**

- A. Required when technical specifications require the manufacturer or supplier to provide qualified personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship, and to start, test, and adjust equipment as applicable.
- B. Submit to the AUTHORITY the manufacturer representative's written reports containing observations and recommendations. Provide three (3) copies and a digital version.

**1.07 TESTING LABORATORY DUTIES**

- A. Testing laboratories retained by the CONTRACTOR shall comply with the requirements of Section 01 45 29 – Testing Laboratory Services.

**PART 2 – PRODUCTS**

**Not Used**

**PART 3 - EXECUTION**

**3.01 GENERAL**

- A. The CONTRACTOR shall provide full and complete documentation of Quality Control procedures and activities in a Quality Control Program and Plan.

**3.02 QUALITY CONTROL**

- A. The CONTRACTOR shall establish a Quality Control Program (Program) which shall establish an independent organization and a methodology to perform the CONTRACTOR's inspection and tests of all items including that of its subcontractors. The Program shall ensure conformance to applicable technical specifications and drawings with respect to the materials, codes, workmanship, storage, installation, construction, finishes, functional performance, and identification. The Program shall be established for all construction work performed under this Contract, including assigned subcontract work. The Program shall specifically include surveillance and tests required in the technical specifications.
- B. The CONTRACTOR shall coordinate all work requiring special inspection with the AUTHORITY to ensure full access by the AUTHORITY's Special Inspectors and Quality Assurance testing personnel to work, work performance, and testing preparation, operations and results.
- C. CONTRACTOR shall describe the Program in a detailed Quality Control Plan that must be approved by the AUTHORITY prior to the start of any construction or offsite fabrication.

- D. The Program shall include, as a minimum, the following components for all definable features of work:
1. Preparatory Inspection Meeting: CONTRACTOR shall schedule and attend a preparatory meeting to review testing procedures a minimum of a week prior to beginning work on any element of Work which has been identified in the Contract Documents to require testing and inspection by the CONTRACTOR testing and inspection by the AUTHORITY, or code-required inspections. Subsequent meetings shall be conducted as necessary to ensure continued accuracy of testing procedures.
  2. Document Control: CONTRACTOR's Program to include procedure for ensuring that all Work is performed in accordance with the following:
    - a. Conformed sets of Contract Drawings and Specifications
    - b. Contract Change Order documents
    - c. Approved Submittals, most current revision
    - d. Applicable Requests for Information (RFI's)
    - e. Manufacturer's Instruction.
  3. In Progress Inspection: CONTRACTOR shall perform in-progress inspections as work progresses on the Work which shall include, but not be limited to:
    - a. Examination of the quality of workmanship with respect to Contract Drawings, Technical Specifications and Approved Submittals.
    - b. Review of control testing for compliance with Contract requirements.
    - c. Inspection for use of defective or damaged materials, omissions and dimensional requirements.
    - d. Review of timeliness and scheduling requirements for all tests, retests and eventual approvals.
    - e. CONTRACTOR Deficiency Reports and punch lists as appropriate to the level of completion of the work.
  4. Non-Conformance Procedure: CONTRACTOR's program shall include procedure for identifying, documenting, tracking, and resolving items in the Work which do not comply with Contract Documents, Specifications, Approved Submittals, or Manufacturer's Instructions. If a quality control test indicates that the tested material does not conform to the requirements of the contract documents, the CONTRACTOR shall eventually take supplemental tests at the same location from which the non-conforming result was obtained, to document conformance and acceptability for payment. Otherwise, the AUTHORITY reserves the right to reject materials for which final Quality Control tests indicate non-conformance with the contract documents.
  5. Code Required Inspection: CONTRACTOR shall coordinate and make timely requests for inspections, tests and other activities required by codes and regulations as specified, which are to be provided by others. This requirement includes coordinating with and providing access to the Authority Having Jurisdiction. (AHJ)

### **3.03 RECORD KEEPING**

- A. The CONTRACTOR shall maintain current Quality Control records, on forms acceptable to the AUTHORITY, of all inspections and tests performed. The records shall include factual

evidence that the required inspections or tests have been performed, including, but not limited to, the following information for each such test and inspection: specification reference, date, type and number of inspections or test involved; results of the inspections, tests or retests; the nature of defect, causes for rejection, proposed remedial action, corrective action(s) taken, and similar information related to any reinspection.

- B. The CONTRACTOR shall maintain and submit to the AUTHORITY the following Quality Control records and reports:
1. Daily Reports: The CONTRACTOR shall maintain a daily log of all inspections performed for both CONTRACTOR and subcontractor operations. The Daily Log shall include compliance with shop submittals, identification by specification section and schedule activity of inspections, tests, and retests conducted, results of inspections and tests, location and nature of defects found, causes for rejection, and remedial or corrective actions taken or proposed. One copy of Daily Reports shall be submitted to the AUTHORITY by 12:00 noon of the next business day.
  2. Immediate Notification of Deficiencies: CONTRACTOR shall provide immediate notification to the AUTHORITY whenever a failed nonconforming test or inspection occurs. This immediate notification shall be followed up with the required written reports.
  3. Nonconformance Report: CONTRACTOR shall submit three copies of a weekly Nonconformance Report to the AUTHORITY identifying all substandard inspections and tests taken during the week including identification by specification section and schedule activity of the inspection or test, location and nature of defects, causes for rejection and remedial actions taken or proposed. The Nonconformance Report shall also identify corrective actions taken or proposed for any open items on prior Nonconformance Reports including a scheduled date for resolution of each item. The Nonconformance Report shall be submitted and discussed in each Weekly Progress Meeting.
  4. Inspection Control Log: CONTRACTOR shall maintain an inspection control log chronologically recording each inspection and test performed by the CONTRACTOR, including the nature of the inspection, test or retest, the date performed, the results, causes for rejection, remedial action or corrective action taken and dates of subsequent inspections and retests, and final acceptance. The CONTRACTOR shall submit three (3) copies plus an electronic copy of the updated Inspection Control Log weekly to the AUTHORITY; the Log will be discussed in each Weekly Progress Meeting.
  5. Testing Laboratory Data: Maintain and submit to AUTHORITY in accordance with Section 01 45 29.

### **3.04 ORGANIZATION**

- A. The Program shall be implemented by the establishment of a Quality Control Organization which shall as a minimum, consist of the following: Quality Control personnel shall be dedicated to Quality Control duties only, and independent of the production and commercial aspects of the CONTRACTOR's full organization.
1. Quality Control Manager: The Quality Control Manager shall have the following qualifications: Minimum of 5 years experience in a supervisory Quality Control position

whose sole responsibility is to ensure compliance with the Contract Documents. This person shall be employed on this Project only, shall be physically on the Project site during performance of all Contract Work, and shall be in charge of the CONTRACTOR's Quality Control Organization. The Quality Control Manager shall report directly to the responsible corporate officer of the firm.

2. **Quality Control Inspectors:** The Quality Control Inspectors shall report directly to the Quality Control Manager. Quality Control Inspectors shall be provided as required to meet requirements of the Contract Documents for CONTRACTOR testing and inspection and as needed to verify that all aspects of the Work comply with the technical requirements of the Contract. Inspectors shall have minimum 5 years experience inspecting the type of work being inspected. Submit qualifications as part of the Quality Control Plan.
  3. **Independent Testing and Inspection Laboratories:** Provide and pay for an industry-recognized, independent laboratory or laboratories to perform all Quality Control tests and/or inspections as may be indicated by the nature of the construction or as specifically required under the terms of the Contract.
  4. **Electrical and Mechanical Testing:** If specified elsewhere, provide and pay for an independent testing firm (or firms) performing electrical and mechanical testing. The testing firm shall be a corporately and financially independent testing organization that can function as an unbiased testing authority, professionally independent of the manufacturers, suppliers, and installers of equipment or systems evaluated by the testing firm. Follow Technical Product Specifications Quality Control requirements and testing responsibilities.
  5. **Manufacturers' Representative:** Provide review and inspection by qualified technical non-sales manufacturers' representatives for specific work as appropriate, or as directed by the AUTHORITY including but not limited to, roofing, waterproofing, skylights, window wall and building system, and fireproofing.
- B. **Staffing Levels:** Provide sufficient qualified personnel to monitor the work quality at all times. The scheduling and coordinating of all inspection and testing must match the type and pace of work activity.
1. In cases where multiple trades, disciplines or subcontractors are on site at the same time, each activity shall be inspected and tested by personnel skilled in that portion of the work.
  2. In cases where multiple shifts are employed, the Quality Control staff shall be increased as required to monitor the work on each shift.

### **3.05 QUALITY CONTROL PLAN**

- A. Provide a Quality Control Plan to the AUTHORITY as soon as practicable, and in no event later than 15 days after Notice to Proceed. Plan shall be updated as required by "Detailed Quality Control Procedures" below, and approved by the AUTHORITY prior to construction.
- B. **Quality Control Plan Contents:** Include the personnel, procedures, instructions and documents to be used.
  1. **Organization:** A description of the CONTRACTOR's Quality Control Organization, including:



- a. An organization chart showing lines of authority and relationship of the quality control organization to other CONTRACTOR management and project personnel.
  - b. Names and resumes of work experience and qualifications of personnel in the quality control organization.
  - c. Area of responsibility and authority of each individual in the quality control organization.
2. Inspection:
- a. Methods of performing quality control inspections including those for each subcontractor's work.
  - b. Detailed lists of inspection activities for each specification section. See "Detailed Quality Control Procedures" below.
3. Testing:
- a. Description of how testing will be performed including identification and qualifications of the industry recognized testing laboratory or laboratories proposed for the work.
  - b. Identify the testing methods, frequency, and number to be taken of each type of material requiring Quality Control testing. To facilitate the development of a testing plan, the AUTHORITY will provide a tabular schedule of minimum testing requirements, to be derived from the requirements contained in the contract documents. The CONTRACTOR shall be responsible for taking the tests summarized in the schedule, in conjunction with any other tests that may be required in the contract documents.
4. Documentation: Method of documenting Quality Control operation, inspection and testing.
5. Administration: Methods of administering Quality Control operations document control, non-conformance procedure, inspection and testing.
6. Letter of Authority: A copy of a letter of direction to the CONTRACTOR's Quality Control Manager responsible for quality control outlining that person's duties and responsibilities and signed by responsible officer of the firm. This letter shall include the authority to halt construction and direct removal and replacement of work not in compliance with the Contract.
7. Forms: Sample copies of all forms and reports to be used, a flow chart describing their distribution, and identification of those documents to be retained by the CONTRACTOR.
8. Subcontractor's Quality Control: The CONTRACTOR shall include, as part of its Quality Control Plan, specific methods of performing quality control inspections of onsite and offsite subcontractors.
9. Detailed Quality Control Procedures: Detailed descriptions of quality control activities for work under each section of the specifications. Include list of all tests, inspection and frequencies, personnel, and instruction prior to starting such work. The procedures shall be updated each month incorporating any changes. Changes shall be submitted at least one month prior to Work effected by any change.

C. Quality Control Plan Approval

1. Before the CONTRACTOR's Quality Control Plan is officially submitted, the CONTRACTOR shall meet with the AUTHORITY and discuss the CONTRACTOR's Quality Control Plan. The CONTRACTOR and the AUTHORITY shall jointly develop a mutual understanding of the details of the plan, including the forms to be used for recording the quality control operations, inspections, administration of the plan for both onsite and offsite work, and the interrelationship of CONTRACTOR and AUTHORITY inspection. The CONTRACTOR shall prepare minutes of the meeting, which shall be incorporated in the CONTRACTOR's Quality Control Plan, which shall then be officially submitted for approval.
2. If the AUTHORITY determines that the Quality Control Plan, personnel, inspections, tests, or records are not adequate, corrective actions shall be taken as directed prior to payment of the next monthly CONTRACTOR's Progress Report.
3. Notify the AUTHORITY in writing of any proposed change to the CONTRACTOR's Quality Control Plan; no such change shall be implemented prior to approval in writing by the AUTHORITY.

D. Quality Control Plan Implementation: Implementation of the Quality Control Plan is the responsibility of the CONTRACTOR. This implementation will be monitored by the AUTHORITY and deficiencies therein will be corrected at the sole expense of the CONTRACTOR.

**3.06 QUALITY SURVEILLANCE BY THE AUTHORITY**

A. All items of materials and equipment shall be subject to surveillance testing and inspection by the AUTHORITY at the point of production, manufacture or shipment to determine if the producer, manufacturer or shipper maintains an adequate inspection system which insures conformance to the applicable specifications and drawings with respect to materials, workmanship, construction, finish, functional performance and identification. In addition, all items or materials, equipment and work in place shall be subject to surveillance testing and inspection by the AUTHORITY at the site for the same purposes. Surveillance by the AUTHORITY does not relieve the CONTRACTOR of performing Quality Control inspections and testing of either onsite or offsite CONTRACTOR's or subcontractor's workplace or manufacturing assembly plant.

**END OF SECTION**

**SECTION 01 45 23  
AUTHORITY INSPECTION SERVICES**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Testing and inspection services provided by the AUTHORITY.

**1.02 RELATED REQUIREMENTS**

- A. Section 00 70 00 - General Conditions
- B. Section 00 70 00 - General Conditions: Article 13, Substantial Completion, Final Inspection.
- C. Section 01 45 00 - Quality Control
- D. Section 01 45 29 - Testing Laboratory Services
- E. Section 01 73 00 - Execution Requirements
- F. Individual Specifications Sections: Inspections and tests required, and standards for testing.

**1.03 REFERENCES**

- A. International Building Code
- B. Special Inspection Program as approved by Authority Having Jurisdiction (AHJ)
- C. IEEE National Electric Safety Code (NESC)

**1.04 DESCRIPTION**

- A. In accordance with the International Building Code and IEEE National Electrical Safety Code and NFPA 70 National Electrical Code, the AUTHORITY will provide Special Inspection Services. These services are in addition to those inspection and testing services provided by the CONTRACTOR under Section 01 45 00 – Quality Control and Section 01 45 29 – Testing Laboratory Services and AHJ permit inspections.
- B. The CONTRACTOR is responsible for requesting Special Inspection Services from the AUTHORITY for the following work activities:
  - 1. Soil compaction: Special Inspector to monitor the soils compaction process and review soils compaction testing data provided by the CONTRACTOR.
  - 2. Asphalt: Special Inspector to monitor placement of asphalt and review asphalt testing data provided by the CONTRACTOR.
  - 3. Concrete and concrete reinforcement: Special Inspector to monitor placement of concrete reinforcing steel, review concrete sampling and testing data provided by the CONTRACTOR, perform other related inspections as required by the IBC.
  - 4. Other special inspections and activities required by the NESC, NFPA 70 and Authority Having Jurisdiction (AHJ)

**1.05 REQUEST AND PAYMENT**

- A. The CONTRACTOR shall request services provided by the AUTHORITY to perform specified inspection and testing.

- B. Inspection by the AUTHORITY or its agents shall in no way relieve CONTRACTOR of obligation to perform Work in accordance with requirements of Contract Documents

**1.06 CONTRACTOR SUBMITTALS**

- A. The CONTRACTOR shall coordinate with the AUTHORITY to provide adequate advance notice to enable the AUTHORITY'S special inspector(s) to be present when necessary.
- B. A Materials Placement Schedule shall also be submitted each Thursday for the work scheduled for the following week, if requested by the AUTHORITY. This schedule shall include the date and time each material, required to have materials testing or inspection, is scheduled for placement or observation. A schedule of material deliveries to the site of materials stored for incorporation into work items, which require Special Inspection, may also be required upon notification from the Authority.
- C. The CONTRACTOR shall provide a minimum of 8 hours written notification counting only working hours and working days of a change in the Special Inspection schedule of time and/or date. Submit written notification, which provides the Project name and location, CONTRACTOR'S name, and phone number, inspection cancelled, time changed or added, and reason for the change. Failure to provide this notification will result in a reduction of the Contract value for extra costs incurred by the AUTHORITY.
- D. A CONTRACTOR request for re inspection of previous Work shall include the AUTHORITY'S prior report, listing of deficiencies, and remedies provided since prior inspection.

**1.07 AUTHORITY RESPONSIBILITIES**

- A. Review schedules and request for inspections as submitted by CONTRACTOR for timeliness and conformance.
- B. Provide qualified personnel at site after due notice; cooperate with CONTRACTOR in performance of services.
- C. Perform specified inspection, inventorying, and testing of products in accordance with specified standards.
- D. Promptly notify CONTRACTOR of observed irregularities or non-conformance of Work or products.
- E. Perform additional inspections and re-tests required by the Contract Documents.
- F. When applicable provide to the CONTRACTOR a written description of the AUTHORITY'S costs attributed to the inspection.

**1.08 AUTHORITY REPORTS**

- A. After each inspection or test, the AUTHORITY will promptly submit one copy of inspection report to the CONTRACTOR. The report will include: date issued, project title, AUTHORITY project number, name of inspector(s), date and time of inspection, identification of product and Specifications section, location in the Project, type of inspection or test, results of inspection or tests, and conformance with Contract Documents. When requested in writing by the CONTRACTOR, the AUTHORITY will interpret the results.

**1.09 LIMITS ON AUTHORITY RESULTING FROM INSPECTIONS**

- A. The AUTHORITY may not release, revoke, alter, or enlarge on requirements of the Contract Documents through the issuance of an inspection report.
- B. The AUTHORITY may not approve or accept any portion of the Work through the issuance of an inspection report.
- C. The AUTHORITY may not assume any duties of the CONTRACTOR through the issuance of an inspection report.
- D. The AUTHORITY inspection report shall not constitute a stop work order.

**1.10 CONTRACTOR RESPONSIBILITIES**

- A. Pre-construction Inspection Meeting. The CONTRACTOR shall arrange a meeting of all parties involved with Special Inspection, Inspection, and testing to be conducted by the Authority Having Jurisdiction (AHJ), to review all inspection requirements, particularly those involving Special Inspection.
- B. Special Inspection Notification: The CONTRACTOR shall notify the AUTHORITY 72 hours in advance of each required special inspection. The CONTRACTOR is responsible for notifying the AUTHORITY in a timely manner regarding individual inspections for items listed in the Specifications and as noted in the Special Inspection Program approved by the AHJ. Adequate notice shall also be provided so that the Special Inspector has time to become familiar with the project.
- C. Inspector access to approved plans: The CONTRACTOR shall be responsible for providing the Special Inspector access to or copies of approved plans at the job site.
- D. Availability of Test Reports: The CONTRACTOR shall make copies of all test reports that are pertinent to the responsibilities of the Special Inspector available to that individual.
- E. Access to Areas of Work: The CONTRACTOR shall provide adequate, safe means for the Special Inspector to access the areas to be inspected.
- F. Retention of Special Inspection Records: The CONTRACTOR shall be responsible for retaining at the job site copies of all special Inspection records submitted by the Special Inspector and copies of test reports, material ticket, etc. These records shall be available for review by the AHJ upon request.
- G. Cooperate with AUTHORITY personnel, and provide access to work and to manufacturer's facilities.
- H. Provide incidental labor and facilities to provide safe access to work to be inspected, to obtain and furnish incidental supplies at the site or at source of products to be inspected, to facilitate tests and inspections, and for storage and curing of test samples when appropriate.
- I. Notify the AUTHORITY as required above in CONTRACTOR Submittals for operations requiring inspection, special inspection and testing services.
- J. Pay costs of AUTHORITY furnished services for all re-inspections as required by Contract Documents.

**PART 2 - PRODUCTS**

**Not Used**

**PART 3 – EXECUTION**

**Not Used**

**END OF SECTION**



**SECTION 01 45 29**  
**TESTING LABORATORY SERVICES**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. CONTRACTOR'S requirements for quality control inspections and testing.

**1.02 RELATED REQUIREMENTS**

- A. Section 00 70 00 General Conditions: Inspections, testing, and approvals required by public authorities
- B. Section 01 33 00- Submittal Procedure
- C. Section 01 45 00 Quality Control
- D. Section 01 45 23 – AUTHORITY Inspection Service.
- E. Section 01 73 00 – Execution Requirements
- F. Individual Specification Sections: Inspections and tests required, and standards for testing

**1.03 REFERENCES**

- A. NETA National Electrical Testing Association:
  - a. ATS, Standard for Acceptance Testing Specifications for Electric Power Equipment and Systems.
  - b. ECS, Standard for Electrical Commissioning Specification for Electrical Power Equipment and Systems.

**1.04 SELECTION AND PAYMENT**

- A. The CONTRACTOR shall employ and pay for the services of an independent, industry-recognized testing laboratory or laboratories to perform specified inspection and testing. The laboratory shall be corporately and financially independent of the CONTRACTOR's organization, as well as of any organization which is associated with performing the Work, such that it can offer an unbiased professional appraisal of compliance with the technical requirements of the Contract. The qualifications of the proposed testing laboratory and personnel shall be submitted to the AUTHORITY for review and approval, 30 days prior to any inspection or testing by the laboratory.
- B. Employment of testing laboratory shall in no way relieve the CONTRACTOR of obligation to perform Work in accordance with requirements of the Contract Documents.

**1.05 QUALITY ASSURANCE**

- A. Comply with requirements of NETA ATS and NETA ECS.
- B. Provide acceptable qualifications of proposed testing laboratory to AUTHORITY for approval prior to Work.

- C. The testing laboratory shall maintain an Alaska registered Engineer on staff to review services.
- D. The laboratory shall be authorized to operate in State in which testing is performed.
- E. Testing equipment shall be calibrated at reasonable intervals with devices of having an accuracy traceable to either NBS Standards or accepted values of natural physical constants.

**1.06 CONTRACTOR SUBMITTALS**

- A. Prior to the start of Work, submit testing laboratory name, address, and telephone number, and names of registered Engineer and responsible officer.
- B. Submit copy of report of laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards during most recent tour of inspection, with memorandum of remedies of any deficiencies reported by the inspection.

**1.07 LABORATORY RESPONSIBILITIES**

- A. Test samples of materials and mixes submitted by CONTRACTOR.
- B. Provide qualified personnel at site after due notice; cooperate with the AUTHORITY and the CONTRACTOR for the performance of services.
- C. Perform specified inspection, sampling, and testing of products and installations in accordance with specified standards. When requested, perform these services at locations designated by the AUTHORITY.
- D. Ascertain compliance of materials and mixes with requirements of the Contract Documents.
- E. Promptly notify the AUTHORITY and the CONTRACTOR of observed irregularities or non-conforming Work or products.
- F. Perform additional inspections and tests required by the AUTHORITY.
- G. Attend pre-construction conferences and progress meetings.

**1.08 LABORATORY REPORTS**

- A. Inspection reports shall be transmitted in duplicate each day to the AUTHORITY and the Engineer of Record.
- B. Reports for tests conducted shall be submitted to the AUTHORITY immediately after the results are determined and no later than when the testing agency leaves the site for the day.
- C. Within 24 hours of the completion of each inspection and test, submit ONE copy of the laboratory report directly to the AUTHORITY in addition to copies required by the CONTRACTOR. Include: date issued, project title and AUTHORITY project number, name of inspector, date and time of sampling or inspection, identification of product and specifications section, location in the Project, type of inspection or test, date of test, results of tests, and conformance with Contract Documents. When requested by the AUTHORITY, provide written interpretations of test results.

**1.09 LIMITS ON TESTING LABORATORY AUTHORITY**



- A. The testing laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
- B. The laboratory may not approve or accept any portion of the Work.
- C. The laboratory may not assume any duties specified to be performed directly by the CONTRACTOR.
- D. The laboratory has no authority to stop Work.

**1.10 CONTRACTOR RESPONSIBILITIES**

- A. Deliver to the testing laboratory, at a designated location, adequate samples of materials proposed to be used which require testing, together with proposed mix designs.
- B. Cooperate with laboratory personnel, and provide safe access to Work.
- C. Provide incidental labor and facilities to provide safe access to work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, and for storage and curing of test samples.
- D. Notify the AUTHORITY and the CONTRACTOR's laboratory 48 hours prior to expected time for operations requiring inspection and testing services.
- E. Provide the AUTHORITY 4 hours written notification of change in date and/or time of inspection and/or testing services.
- F. Pay costs of testing laboratory services for all tests.

**PART 2 - PRODUCTS**

**Not Used**

**PART 3 - EXECUTION**

**Not Used**

**END OF SECTION**

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**SECTION 01 51 00  
CONSTRUCTION FACILITIES**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Requirements for furnishing and maintaining construction facilities during the project.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 11 13 – Summary of Work
- B. Section 01 29 76 – Application for Payment
- C. Section 01 52 13 – Field Offices and Sheds
- D. Section 01 71 13 – Mobilization and Demobilization
- E. Section 01 71 23 – Field Engineering
- F. Section 01 73 00 – Execution Requirements

**1.03 TEMPORARY ELECTRICITY**

- A. Unless specified elsewhere, the CONTRACTOR shall make its own provisions for temporary electrical service.
- B. Provide lighting for construction operations.

**1.04 TEMPORARY HEAT**

- A. Provide and pay for heat devices, insulated enclosure, tenting, and heat as required to maintain specified conditions for construction operations, to protect materials and finishes from damage due to temperature or humidity.

**1.05 TEMPORARY LAYDOWN AREA**

- A. The Contractor will have an area for staging materials and construction staging onsite. Area will be coordinated with the Operator.

**1.06 NOT USED**

**1.07 TEMPORARY SANITARY FACILITIES**

- A. Unless specified elsewhere, onsite reasonable use of toilet facilities is authorized.

**1.08 TEMPORARY TELEPHONE SERVICE**

- A. Unless specified elsewhere, provide, maintain and pay for telephone service to the CONTRACTOR field offices.

**1.09 BARRIERS**

- A. Provide as required to prevent entry to construction areas and to protect adjacent properties from damage from construction operations

- B. Maintain lights of such size and location each night between the hours of sunset and sunrise upon all obstructions resulting from work which may endanger or obstruct vehicle traffic, and be responsible for all damages to persons and property resulting from failure to maintain lights. Designate personnel to replace or relight markers or barricades and provide the AUTHORITY with their names and telephone numbers for use in summoning them as necessary.

**1.10 NOT USED**

**1.11 ENCLOSURES**

- A. Provide adequate weather protection to any temporary building or enclosure penetrations until final weather tight installation is provided.

**1.12 NOT USED**

**1.13 PROTECTION OF INSTALLED WORK**

- A. Protect installed Work and provide special protection where specified in individual specification sections.
- B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to prevent damage.
- C. Not Used

**1.14 SECURITY**

- A. Provide security and facilities to protect Work from unauthorized entry, vandalism, or theft.

**1.15 REMOVAL OF UTILITIES AND FACILITIES**

- A. Remove CONSTRUCTION FACILITIES, equipment (including temporary boiler stack), facilities, and materials, prior to Substantial Completion inspection.
- B. Remove underground installations to a minimum depth of 3 feet below finish grades. Grade site as indicated.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore permanent facilities used during construction to specified condition.

**1.16 SHORING AND BRACING**

- A. The CONTRACTOR is responsible for designing and providing shoring and bracing permit required to accomplish the work. This includes shoring adjacent facilities, shoring for excavation work, and shoring and bracing for installation of concrete, masonry, and steel.
- B. The CONTRACTOR's shoring and bracing for protecting existing facilities, for stabilizing excavations, for supporting elevated slabs, and for resisting loads that could result in damage to existing construction or injury to workers, shall be designed by an Alaska registered civil engineer.

- C. Provide a sealed and signed copy of shoring and bracing calculations and drawings to the AUTHORITY for informational purposes only. The submission of calculations to the AUTHORITY shall not transfer responsibility for the design of shoring and bracing to the AUTHORITY. Rather, the AUTHORITY will receive the calculations to verify they have been done by a registered engineer.

**1.17 PRE-CONSTRUCTION PROPERTY AND STRUCTURE ASSESSMENTS**

- A. The CONTRACTOR shall perform pre-construction condition assessments of adjacent properties and structures to the site.
- B. The assessments shall be performed by a qualified company with 5 years of experience performing commercial building condition assessments. Submit qualifications to the AUTHORITY.
- C. Assessments shall be provided in written and DVD format.

**1.18 COST RESPONSIBILITY**

- A. Except as otherwise noted, the cost of construction facilities and utilities shall be the responsibility of CONTRACTOR.

**PART 2 - PRODUCTS**

**Not Used**

**PART 3 - EXECUTION**

**Not Used**

**END OF SECTION**

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**SECTION 01 52 13  
FIELD OFFICES AND SHEDS**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Requirements for field offices and sheds for use by the CONTRACTOR and the AUTHORITY during construction.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 11 13 – Summary of Work
- B. Section 01 29 76 – Application for Payment
- C. Section 01 51 00 – Construction Facilities
- D. Section 01 71 13 – Mobilization and Demobilization

**1.03 CONSTRUCTION**

- A. Coordinate Construction of Field offices to meet the requirements of the Authority Having Jurisdiction.

**1.04 CONTRACTOR OFFICE**

- A. Provide field office(s) to provide adequate office space for the CONTRACTOR'S on-site administrative personnel. Offices shall be weather-tight, with lighting, electrical outlets, heating and ventilating equipment, telephone and fax service, and equipped with furniture.
- B. The CONTRACTOR shall provide any office equipment, supplies, and utilities that it deems necessary to support its on-site operations.

**1.05 STORAGE SHED**

- A. Provide as required for Tools, Materials, and Equipment. The sheds shall be Weather-tight, with adequate heat and ventilation for products requiring controlled conditions, with adequate space for organized storage and access, and adequate lighting for inspection of stored materials.
- B. Provide adequate security to protect the contents of storage sheds.

**1.06 NOT USED**

**PART 2 - PRODUCTS**

**Not Used**

**PART 3 - EXECUTION**

**Not Used**

**END OF SECTION**

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**SECTION 01 60 00  
MATERIAL AND EQUIPMENT**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Requirements for transportation and handling, storage and protection, substitutions, and product options.

**1.02 RELATED REQUIREMENTS**

- A. Section 00 70 00 – General Conditions
- B. Section 01 33 23 – Shop Drawings
- C. Section 01 42 19 Reference Standards
- D. Section 01 33 00 - Submittal Procedures
- E. Section 01 45 00 – Quality Control
- F. Section 01 51 00 – Construction Facilities
- G. Section 01 60 00A – Substitution Request Form
- H. Section 01 73 00 – Execution Requirements

**1.03 TRANSPORTATION AND HANDLING**

- A. Transport products by methods to avoid product damage; deliver in undamaged condition in manufacturer's unopened containers or packaging, dry.
- B. Provide equipment and personnel to handle products by methods to prevent soiling or damage.
- C. Immediately on delivery, inspect shipment to assure:
  - 1. Product complies with requirements of Contract Documents and reviewed submittals.
  - 2. Quantities are correct.
  - 3. Accessories and installation hardware are correct.
  - 4. Containers and packages are intact and labels legible.
  - 5. Products are protected and undamaged.

#### **1.04 STORAGE AND PROTECTION**

- A. Handle and store materials for construction, products of demolition, and other items to avoid damage to existing buildings, and infrastructure. Do not overload the structure.
- B. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather tight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions.
- C. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.
- D. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter. Cover such material to prevent material from being blown or transported away from the stockpile.
- E. Arrange storage to provide access for inspection. Periodically inspect to assure products are undamaged, and are maintained under required conditions.

#### **1.05 SUBSTITUTIONS**

- A. Substitutions shall be allowed during the Bidding period only if Document 00100, Information to Bidders, designates a time for submitting requests for substitutions under requirements specified in this Section.
- B. Only one request for substitution will be considered for each product from each Prime Bidder/CONTRACTOR. When substitution is not accepted, Prime Bidder/CONTRACTOR shall provide specified product.
- C. AUTHORITY will consider requests for Substitutions only within 90 days after date established in Notice to Proceed.
- D. Substitutions may be considered when a Product becomes unavailable through no fault of the CONTRACTOR.
- E. Document each request with complete data substantiating compatibility of proposed Substitution with Contract Documents.
- F. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

**1.06 SUBSTITUTION SUBMITTAL PROCEDURE:**

- A. Submit four copies of Request for Substitution for consideration on Substitution Request form provided by AUTHORITY (Section 01 60 00-A). Limit each request to one proposed Substitution.
- B. Submit certification signed by the CONTRACTOR: that the CONTRACTOR:
  - 1. Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product. List similar projects using proposed product, dates of installation and user telephone number.
  - 2. Will provide an equivalent warranty for the Substitution as for the specified Product.
  - 3. Will coordinate installation and make changes to other Work, which may be required for the Work to be complete with no additional cost to AUTHORITY.
  - 4. Waives claims for additional costs or time extension, which may subsequently become apparent from indirect costs.
  - 5. Will reimburse AUTHORITY for review or redesign services associated with re-approval by Authorities.
- C. Submit shop drawings, manufacturers' product data, and certified test results attesting to the proposed Product equivalence and variations between substitute and specified product. The burden of proof is on proposer.
- D. The AUTHORITY will notify CONTRACTOR in writing of decision to accept or reject request.

**PART 2 - PRODUCTS**

**2.01 PRODUCTS**

- A. Products include material, equipment, and systems.
- B. Comply with Specifications and referenced standards as minimum requirements.
- C. Components required to be supplied in quantity within a Specification section shall be the same, and shall be interchangeable.
- D. Do not use materials and equipment removed from existing structure, except as specifically required, or allowed, by Contract Documents.

**2.02 PRODUCT OPTIONS**

- A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers followed by the term "No Substitutions": use only specified manufacturers, no substitutions allowed.

- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions:  
Submit a request for substitution for any manufacturer not specifically named that meets the description specifications of the named manufacturers.

**PART 3 - EXECUTION**

**Not Used**

**END OF SECTION**

<b>ALASKA INDUSTRIAL DEVELOPMENT EXPORT AUTHORITY</b>	<b>SUBSTITUTION REQUEST FORM (AFTER AWARD)</b>	<b>01 60 00A</b>
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Project: Ketchikan Shipyard Medium Voltage Loop

Project No.: 19014

Contractor: \_\_\_\_\_

Specified item for which substitution is requested: \_\_\_\_\_  
(reference specification section and paragraph)

The following product is submitted for substitution: \_\_\_\_\_  
(describe proposed substitution and differences from specified item; attach complete technical, performance, and test data; state whether substitution affects dimensions and functional clearances shown on drawings or affects other trades, and include complete information for changes to drawings and/or specifications which proposed substitution will require for its proper installation.)

I certify the following:

- | Yes                      | No                       |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | The substitute will perform adequately and achieve the results called for by the general design.   |
| <input type="checkbox"/> | <input type="checkbox"/> | The substitute is similar, of equal substance, suited to the same use, and will provide the same warranty as the product specified.  |
| <input type="checkbox"/> | <input type="checkbox"/> | An equivalent source of replacement parts is available.  |
| <input type="checkbox"/> | <input type="checkbox"/> | The evaluation and approval of the proposed substitute will not delay the Substantial or Final Completion of the project.  |
| <input type="checkbox"/> | <input type="checkbox"/> | Any change in the design necessitated by the proposed substitution will not delay the Substantial or Final Completion of the project.  |
| <input type="checkbox"/> | <input type="checkbox"/> | The cost of any change in the design necessitated by the proposed substitution, including engineering and detailing costs, and construction costs caused by the substitution will be paid by the contractor at no cost to the State. |
| <input type="checkbox"/> | <input type="checkbox"/> | The cost of any license fee or royalty necessitated by the proposed substitution will be paid by the contractor at no cost to the State.   |

The undersigned states that the function, appearance and quality are equivalent or superior to the specified item.

Signed: \_\_\_\_\_ Date: \_\_\_\_\_  
Authorized Contractor Signature

Architect/Engineer Recommendation:

- Accepted     
  Accepted as Noted     
  Not Accepted     
  Received Too Late

Remarks:

Signed: \_\_\_\_\_ Date: \_\_\_\_\_  
Architect/Engineer

Recommend Acceptance / Rejection \_\_\_\_\_ Date: \_\_\_\_\_  
(circle one) Resident Engineer

Accepted  
 Rejected \_\_\_\_\_ Date: \_\_\_\_\_  
Project Manager

**SECTION 01 71 13  
MOBILIZATION AND DEMOBILIZATION**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Requirements for mobilization and demobilization.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 11 13 – Summary of Work
- B. Section 01 29 73 – Schedule of Values
- C. Section 01 29 76 – Application for Payment
- D. Section 01 51 00 – Construction Facilities
- E. Section 01 52 13 – Field Office and Sheds
- F. Section 01 77 00 – Contract Closeout

**1.03 DEFINITIONS**

- A. Mobilization and Demobilization includes:
  - 1. CONTRACTOR's work to prepare Site for Work under Contract and to marshal workers, materials and equipment, and those of subcontractors, to accomplish the Work.
  - 2. Mobilization of all construction equipment, materials, suppliers, appurtenances, and the like, staffed and ready for commencing and prosecuting the Work, and the subsequent demobilization and removal from the site of said equipment, appurtenances, and the like upon completion of the Work.
  - 3. Assembly and delivery to the site of plant, equipment, materials, and supplies necessary for the prosecution of Work which are not intended to be incorporated in the work; the clearing of and preparation of the CONTRACTOR's work area; the complete assembly, in working order, of equipment necessary to perform the required work; personnel services preparatory to commencing actual work; all other preparatory work required to permit commencement of the actual work on construction items for which payment is provided under the Contract.

**1.04 REQUIREMENTS**

- A. Haul routes, staging areas, and security guard and flagger positions will be designated and/or subject to approval by AUTHORITY, who will coordinate with CONTRACTOR to determine requirements and locations.

- B. Cooperate with AUTHORITY in allocation and use of MOBILIZATION AND DEMOBILIZATION areas of Site, field offices and sheds, materials storage, traffic, and parking facilities.
- C. During construction, coordinate use of Site and facilities through AUTHORITY.
- D. Comply with AUTHORITY'S procedures of contract communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- E. Comply with instructions of AUTHORITY for use of utilities and construction facilities.
- F. Coordinate field engineering and layout Work under instructions of AUTHORITY.
- G. Walk through Site with AUTHORITY prior to start of Work.

**1.05 SUBMITTALS**

- A. Refer to Section 01 33 00 - Submittal Procedure, for submittal requirements.
- B. If requested by AUTHORITY, submit a plan of the proposed layout of the construction site, including fences, roads, parking, buildings, staging, and storage areas, within seven (7) days after Notice to Proceed.

**PART 2 – PRODUCTS**

**Not used**

**PART 3 - EXECUTION**

3.01 Delivery: Delivery to the jobsite of construction tools, equipment, materials, and supplies shall be accomplished in conformance with local governing ordinances and regulations and the requirements of the Contract Documents.

3.02 Upon completion of the Work, remove construction tools, apparatus, equipment, unused materials and supplies, plant, and personnel from the jobsite.

**END OF SECTION**

**SECTION 01 71 23  
FIELD ENGINEERING**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Requirements for field surveying.

**1.02 PERFORMANCE REQUIREMENTS:**

- A. The CONTRACTOR shall conduct pre-construction inspection and documentation surveys, accompanied by a representative of the AUTHORITY, prior to start of work.

**1.03 RELATED REQUIREMENTS**

- A. Section 00 70 00 - General Conditions: Basic requirements.
- B. Section 01 11 13 - Summary of Work: Work sequence, Use of premises, and Using Agency occupancy
- C. Section 01 33 00 –Submittal Procedures
- D. Section 01 51 00 – Construction Facilities
- E. Section 01 73 00 – Execution Requirements

**1.04 QUALITY CONTROL**

- A. Land Surveyor: Registered in the State of Alaska, and acceptable to AUTHORITY.
- B. Professional Engineer: Registered Professional Engineer of the discipline required elsewhere in the Contract Documents for specific service on Project, licensed in the State of Alaska.
- C. AUTHORITY reserves the right to field verify all survey data provided by the CONTRACTOR.

**1.05 SUBMITTALS**

- A. Submit name, address, and telephone number of Surveyor/ Engineer before starting survey Work.
- B. Submit survey notes as required by Sections 00 70 00 and 00 80 00.
- C. On request, submit documentation verifying accuracy of survey Work.



1. Submit certificate signed by CONTRACTOR's Surveyor and Engineer, certifying that elevations and locations of improvements constructed under this contract are in conformance, or non-conformance, with Contract Documents.
  2. Field locate all above ground and underground utilities within limits of construction prior to initiating excavation work.
- D. Submit two copies of each survey or inspection report. The AUTHORITY will retain both copies.

#### **1.06 SURVEY RECORD DOCUMENTS**

- A. Maintain complete, accurate log of control and survey Work as it progresses.
- B. On completion of foundation walls, buried utilities, and major site improvements, prepare a certified survey showing dimensions, locations, angles, and elevations of Work completed to permanent surface features, sufficient to develop a certified as-built plot plan and to obtain a certificate of occupancy from the Authority Having Jurisdiction.
- C. Submit record documents under provisions of Section 01 78 39 – Project Record Documents.

#### **PART 2 – PRODUCTS**

**Not Used**

#### **PART 3 - EXECUTION**

##### **3.01 INSPECTION**

- A. Verify locations of survey control points prior to starting Work. Promptly notify AUTHORITY of any discrepancies discovered.

##### **3.02 SURVEY REFERENCE POINTS**

- A. Protect survey control points prior to starting site Work; preserve permanent reference points during construction. Make no changes without prior written notice to AUTHORITY.
- B. Promptly report to AUTHORITY the loss or destruction of any reference point or relocation required because of changes in grades or other reasons. Replace dislocated survey control points based on original survey control.

##### **3.03 SURVEY REQUIREMENTS**

- A. Establish a minimum of one permanent bench mark on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.
- B. Establish lines and levels, locate and lay out by instrumentation and similar appropriate means:
  1. Site improvements, including pavements; stakes for grading, fill and topsoil replacement; and utility locations, slopes, invert elevations, switch cabinets, etc.
  2. Grid or axis for structures.

3. Building foundation, column locations, and ground floor elevations.
  - A. Periodically verify layouts by same means.
  - B. The CONTRACTOR shall obtain all field measurements for the accurate fabrication and installation of the work included in the Contract. Exact measurements are the CONTRACTOR's responsibility.
  - C. The CONTRACTOR shall furnish or obtain templates, patterns, and installation instructions as required for the installation of work. All dimensions shall be verified in the field.
  - D. Establish and maintain records of all existing and new utility locations.

**3.04 SURVEYING ACCURACY AND TOLERANCES**

- A. Control Traverse surveys, computations and staking of the building grid control points shall be performed to the Third Order, Class I traverse surveys (1:10,000) as specified in the "Standards and Specifications for Geodetic Control Surveys," Federal Geodetic Control Committee.
- B. Vertical Accuracy requirements for building foundations will meet the Survey Accuracy Requirements for Bridges as defined in "Construction Surveying Requirements," State of Alaska AUTHORITY of Transportation and Public Facilities.
- C. All other construction survey will be performed in accordance with "Construction Surveying Requirements".

**3.05 AUTHORITY AS-BUILT SURVEY**

- A. AUTHORITY completed a boundary survey as part of the project. Survey will be made available to CONTRACTOR in cad and/or hard copy upon request.

**END OF SECTION**

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**SECTION 01 72 00  
UTILITIES COORDINATION**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Coordination of utilities to be provided by the CONTRACTOR, AUTHORITY, and others, and utility locates.

**1.02 RELATED DOCUMENTS**

- A. Section 00 70 00 – General Conditions
- B. Section 01 11 13 – Summary of Work
- C. Section 01 31 14 – Work Coordination
- D. Related Technical Specification Sections

**1.03 UTILITIES PROVIDED BY OTHERS**

- A. The AUTHORITY will provide permanent utilities listed in this section, to points of demarcation shown in the Contract Documents, under separate agreements with utility companies. The CONTRACTOR shall coordinate with the AUTHORITY to sequence the provision of utilities provided by others with its Work.
- B. Utilities to be provided by the AUTHORITY are described below.
  - 1. Electrical Service: AUTHORITY will provide.
  - 2. Water: AUTHORITY will provide.
  - 3. Sewer: AUTHORITY will provide.
- C. The CONTRACTOR shall notify the AUTHORITY at least Thirty (30) calendar days before it needs utility companies retained by the AUTHORITY to begin work on the site. Coordinate with the AUTHORITY to enable the utilities to be installed as per the requirements of the CONTRACTOR'S schedule.
- D. Not Used

**1.04 UTILITIES PROVIDED BY CONTRACTOR**

- A. The CONTRACTOR shall provide permanent utilities listed in this section as shown in the contract documents.
- B. Not Used

**PART 2 - PRODUCTS**

**Not Used**

**PART 3 - EXECUTION**

**3.01 UTILITY LOCATES**

- A. The CONTRACTOR shall request field locates from all utilities having facilities in the area a minimum of seven (7) calendar days prior to excavation.
- B. The location and elevation of existing utilities shown on the Plans are approximate only. Additional utilities may exist that are not shown on the Plans. Before starting construction, the CONTRACTOR shall request all utility owners to locate their utilities and, at points of possible conflict, the CONTRACTOR shall uncover the located utilities.
- C. The CONTRACTOR shall repair any damage caused to utilities by the CONTRACTOR's operations at no cost to the AUTHORITY.
- D. The CONTRACTOR shall protect and work around existing underground utilities.
- E. Comply with requirements of utility companies when working with, in, or around their utilities.

**3.02 NOTIFICATION FOR COORDINATION WITH UTILITY COMPANIES**

- A. Provide the AUTHORITY and affected utility companies a minimum of thirty (30) calendar days advance written notice of any work requiring coordination with utility companies, or longer notification as required by the utility companies. The utility companies will not be required to work at more than one location at a time, and shall be allowed to complete work at a specific location prior to commencing with work at another specific location.

**3.03 STAGING DURING THE WORK**

- A. Coordinate with utility companies, whether retained by the AUTHORITY or the CONTRACTOR, to allow adequate staging area on-site for utility companies to perform their work.
- B. Designate and dedicate area seven calendar days prior to required Utility mobilization. Allow for multiple mobilizations as required to accommodate Contractor schedule.

**END OF SECTION**

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**SECTION 01 73 00  
EXECUTION REQUIREMENTS**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Requirements for addressing defects, cleaning, operating and maintenance manuals, spare parts, training, warranties and bonds, and maintenance service.

**1.02 RELATED REQUIREMENTS**

- A. Section 00 70 00 - General Conditions: Fiscal provisions, legal submittals, and other administrative requirements
- B. Section 01 26 63 – Change Procedures
- C. Section 01 31 19 – Project Meetings
- D. Section 01 33 00 –Submittal Procedures
- E. Section 01 33 23 – Submittal Procedures
- F. Section 01 45 23 – AUTHORITY Inspection Services
- G. Section 01 45 29 – Testing Laboratory Services
- H. Section 01 60 00 – Material and Equipment
- I. Section 01 71 23 – Field Engineering

**1.03 CLOSEOUT PROCEDURES**

- A. Comply with Section 01 77 00 - Contract Closeout Procedures.

**1.04 DEFECTS**

- A. Product defects shall be all items that affect the visual appearance or function of the Products. Defects shall be as identified below unless more stringent requirements are specified within specific sections.
- B. Products shall be shall typically be viewed from a distance of 30.0 inches (760 mm).
- C. Defects shall be solely determined by the AUTHORITY'S Project Manager.
- D. Defects, Product:

1. Cuts, Scrapes, Gouges Abrasions 0.250 inch (6 mm) long or longer than and 0.03125 inches (0.79375 mm) wide or wider that are visible at a distance of 30.0 inches (762 mm) shall be considered defects.
  2. Abrasions less than the above shall be accepted.
  3. Burns of any size that permanently discolor the surface material shall be considered defects.
  4. Product color variation.
- E. Defects, Joint:
1. Non-alignment of Products. Visual defects and non-alignment of joints shall be considered defective.
- F. Defects, Structural:
1. Bent members or other structural damage shall be considered defective.
  2. Incorrectly manufactured members shall be considered defective.
- G. Defects, Corrosion:
1. Surface corrosion not exceeding one percent (1%) of the surface area shall be considered a visual defect.
  2. Surface corrosion exceeding one percent (1%) and not exceeding five percent (5%) of the surface area shall be evaluated by the Project Manager.
  3. Surface corrosion exceeding five percent (5%) of the surface area shall be shall be considered a structural defect.
- H. Defects shall be repaired or replaced as solely determined by the Authority at no additional cost to the AUTHORITY.
1. Structural defects shall be replaced, no exceptions.
  2. Visual defects shall be repaired or replaced as solely determined by the Project Manager.

#### **1.05 PROGRESS CLEANING AND WASTE REMOVAL**

- A. Maintain work and storage areas free of waste materials, debris, and rubbish. Maintain site in a neat and orderly condition to maintain safe passage and exits and to avoid fire hazard. Provide covered containers for deposit of waste materials.
- B. Collect and remove waste materials, debris, and rubbish from site periodically and at least weekly, and dispose off-site. Have equipment and personnel available on-site daily to sweep and scrub roads and parking areas, which are work sites or haul routes.
- C. Pavement striping and markings that cannot be effectively cleaned shall be replaced at expense of CONTRACTOR.

#### **1.06 FINAL CLEANING**

- A. Execute final cleaning prior to Substantial Completion inspection.



- B. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains and foreign substances.
- C. Use materials which will not create hazards to health or property, and which will not damage surfaces. Follow manufacturer's recommendations.
- D. Maintain cleaning until AUTHORITY issues certificate of Substantial Completion.
- E. Remove waste, debris, and surplus materials from site. Clean grounds; remove stains, spills, and foreign substances from paved areas and sweep clean. Rake clean other exterior surfaces.

**1.07 NOT USED**

**1.08 ADJUSTING**

- A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

**1.09 OPERATION AND MAINTENANCE DATA**

- A. Submit data bound in 3-ring slant "D" presentation ring binders, maximum 11-5/5" high and 11-1/4" deep. Spine, front, and back shall be heavy virgin vinyl sealed over heavy board. Binders shall have clear, full size pockets on spine and front cover. Thickness of content shall not exceed 75% of binder manufacturer's stated capacity. All pages shall be 8 1/2" x 11", or 11" x 17" folded to 8 1/2" x 11" in a manner to permit unfolding without removal from binder.

- B. O&M Manual binders shall be black, clearly and permanently labeled as follows:

- a. Spine

Project Name

Project Number

Operations & Maintenance Manual, Volume \_\_\_\_ of \_\_\_\_

Building Name:

- b. Front Cover:

Project Name:

Project No.:

Building Name:

CONTRACTOR:

Address

City, State, ZIP

Phone:

Fax:

Consultant:

Address

City, State, ZIP

Phone:

Fax:

Operations & Maintenance Manual, Volume \_\_\_\_ of \_\_\_\_

Discipline:

Date:

- C. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
- D. Contents: Prepare a Table of Contents for each volume, with each Product or system description identified, typed on 24 pound white paper, in three parts as follows:
  - 1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect/Engineer, CONTRACTOR, Subcontractors, and major equipment suppliers.
  - 2. Part 2: Operation and maintenance instructions, arranged by system process flow and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
    - a. Significant design criteria.
    - b. List of equipment.
    - c. Parts list for each component.
    - d. Operating instructions.
    - e. Maintenance instructions for equipment and systems.
    - f. Maintenance instructions for [special] finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
  - 3. Part 3: Project documents and certificates, including the following:
    - a. Shop drawings and product data.
    - b. Air and water balance reports.
    - c. Certificates.
    - d. Originals of warranties and bonds.

- E. Submit 1 draft copy of completed volumes 90 working days prior to Training or Substantial Completion inspection, whichever is earliest. This copy will be reviewed and returned, with AUTHORITY comments. Revise content of all document sets as required prior to final submission.
- F. Submit three sets of revised final volumes 45 days prior to Training or Substantial Completion inspection, whichever is earliest.
- G. In addition to required hard copies, provide electronic copy on .pdf format with table of contents hyperlinked to all referenced sections.

#### **1.10 TRAINING**

- A. Before Substantial Completion, instruct AUTHORITY designated personnel in operation, adjustment, and maintenance of products, equipment, and systems, at agreed upon times. For equipment requiring seasonal operation, or placed into operation subsequent to Final Completion, perform instructions within six months.
- B. One eight-hour training session following substantial completion. Training shall include the basic elements of the system: Utility interface (UMC and utility disconnect); transformers and pad-mount switches, and cable; Switchboard and power stations etc.
- C. Use operation and maintenance manuals as basis of instruction. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- D. Provide digital video recordings of all provided instruction in format approved by AUTHORITY. Training videos shall be submitted prior to Substantial Completion.
- E. Prepare and insert additional data in Operation and Maintenance Manual when need for such data becomes apparent during instruction.

#### **1.11 SPARE PARTS AND MAINTENANCE PRODUCTS**

- A. Provide spare parts, maintenance, and extra Products in quantities specified in individual specification sections. These shall be labeled and stored per manufacturer's recommendations.
- B. Deliver to Project site and place in location as directed; obtain receipt prior to Substantial Completion payment.

#### **1.12 WARRANTIES AND BONDS**

- A. Provide duplicate notarized copies.
- B. Execute and assemble transferable warranty documents from Subcontractors, suppliers, and manufacturers.
- C. Provide Table of Contents and assemble in three D side ring binder with durable plastic cover.

- D. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.

**1.13 MAINTENANCE SERVICE**

- A. Furnish service and maintenance of components indicated in specification sections for one year from date of Substantial Completion.
- B. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- C. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
- D. Maintenance service shall not be assigned or transferred to any agent or Subcontractor without prior written consent of the AUTHORITY.

**PART 2 - PRODUCTS Not Used**

**PART 3 - EXECUTION REQUIREMENTS Not Used**

**END OF SECTION**

**SECTION 01 73 29  
CUTTING AND PATCHING**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Related Documents and Requirements
- B. General Requirements
- C. Submittals
- D. Structural Work
- E. Operational Systems
- F. Visual Requirements
- G. Existing Warranties
- H. Materials
- I. Inspection
- J. Preparation
- K. Performance
- L. Cleaning

**1.02 RELATED REQUIREMENTS**

- A. Section 01 11 13 - Summary of Work
- B. Section 01 31 14 - Work Coordination
- C. Section 01 33 00 – Submittal Procedures
- D. Section 01 60 00 - Material and Equipment

**1.03 REQUIREMENTS**

- A. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Repairs and Patching: CONTRACTOR shall repair or patch all cut or disturbed areas as incidental to the Work. All patching and repairs shall match adjacent areas in texture, color, materials, and quality of workmanship.

- C. Employ skilled and qualified workers to perform cutting and patching.

#### 1.04 SUBMITTALS

- A. Cutting and Patching Proposal: Prior to proceeding with cutting and patching, submit and obtain AUTHORITY'S review of proposed cutting and patching procedures.
- B. Include the following information, as applicable, in proposal:
  - 1. Describe extent of cutting and patching required. Show how it will be performed and indicate why it is unavoidable.
  - 2. Describe anticipated results in terms of changes to existing construction. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
  - 3. List products to be used and firms or entities that will perform Work.
  - 4. Submit AK-DOT/PF Class A concrete and AK-DOT/PF Class A asphalt pavement mix design for the AUTHORITY's review.
  - 5. Indicate dates and times when cutting and patching will be performed.
  - 6. Describe how the Work may affect operations of the facility user and what measures will be taken to mitigate them.
  - 7. Utilities: List utilities cutting and patching procedures will disturb or affect. Describe how service from affected utilities will be bypassed if necessary to maintain uninterrupted service.
  - 8. Structural: Where cutting and patching involves adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
  - 9. Roofing and Exterior Architectural Systems: Submit information on proposed cutting and patching procedures adequate for the AUTHORITY to obtain in writing from the manufacturer of the existing system that the proposed procedures will not void the manufacturer's warranty. Work shall be performed by an installer authorized by the existing system manufacturer.
- C. The AUTHORITY'S review of cutting and patching proposals does not waive its right to later require complete removal and replacement of unsatisfactory work.

#### 1.05 STRUCTURAL

- A. Requirements for Structural Work: Do not cut and patch structural elements in manner that would change their load-carrying capacity or load-deflection ratio.
- B. Obtain approval of cutting and patching proposal before cutting and patching following structural elements:
  - 1. Foundations
  - 2. bearing and retaining walls
  - 3. structural concrete and masonry units
  - 4. structural steel
  - 5. Lintels

6. timber and primary wood framing
7. structural decking
8. stair systems
9. miscellaneous structural metals
10. exterior curtain-wall constructions
11. equipment supports
12. piping, ductwork, vessel, and equipment
13. structural systems of special construction
14. others as deemed necessary by the AUTHORITY

#### **1.06 OPERATIONAL SYSTEMS**

- A. Obtain approval of cutting and patching proposal before performing cutting and patching work affecting the following operating elements or safety related systems:
  1. primary operational system and equipment
  2. electrical wiring systems
  3. operating system of special construction
  4. others as deemed necessary by the AUTHORITY
- B. Provide bypass or backup systems to minimize downtime and operational impact to existing facility.

#### **1.07 EXISTING WARRANTIES**

- A. Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- B. Work on items covered by warranty shall be done by firm or craftsman authorized by warranty issuer.

### **PART 2 - PRODUCTS**

### **PART 3 - EXECUTION**

#### **3.01 INSPECTION**

- A. Before proceeding meet at Project Site with AUTHORITY and parties involved in cutting and patching, including related trades.
- B. Examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed.
- C. Review areas of potential interference and conflict; coordinate procedures and resolve before proceeding.

#### **3.02 PREPARATION**

- A. Temporary Support: Provide temporary support of work to be cut.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjacent Occupied Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

### 3.03 PERFORMANCE

- A. Cutting: Cut in-place construction by sawing, drilling, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
  - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  - 3. Concrete: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  - 4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  - 5. Proceed with patching after construction operations requiring cutting are complete.
- B. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
  - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
  - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
  - 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
  - 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
  - 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather-tight condition and ensures thermal and moisture integrity of building enclosure.



### 3.04 CLEANING

- A. Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, base, earthen materials, concrete, asphalt, and similar materials from adjacent finished surfaces.

**END OF SECTION**

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**SECTION 01 77 00  
CONTRACT CLOSEOUT PROCEDURES**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Requirements for Substantial Completion
- B. Requirements for Final Completion
- C. Requirements for Final Payment and Final Acceptance

**1.02 RELATED SECTIONS**

- A. Section 00 70 00 - General Conditions: Substantial Completion, Final Completion, Final Payment, Final Acceptance
- B. Section 01 11 13 - Summary of Work: Using Agency occupancy
- C. Section 01 33 00 – Submittal Procedures
- D. Section 01 29 73 – Schedule of Values
- E. Section 01 29 76 – Application for Payment
- F. Section 01 31 13 – Job Site Administration
- G. Section 01 45 23 – AUTHORITY Inspection Service: CONTRACTOR'S Responsibilities
- H. Section 01 71 13 – Mobilization and Demobilization
- I. Section 01 73 00 – Execution Requirements: Final cleaning, Project Record Documents, Operation and Maintenance Data, Warranties and Bonds, Spare Parts and Maintenance Materials
- J. Section 01 78 39 – Project Record Documents
- K. Section 01 91 00 - Commissioning

**1.03 SUBSTANTIAL COMPLETION SUBMITTALS**

Submit the following prior to requesting the Substantial Completion Inspection:

- A. Evidence of Compliance with Requirements of Authority Having Jurisdiction:
  - 1. Certificate of Occupancy

2. Required Certificates of Inspection
  3. Other approvals as may be required
- B. Project Record Documents
  - C. Operation and Maintenance Data
  - D. Spare Parts and Maintenance Materials
  - E. Warranties and Bonds
  - F. Keys and Keying Schedule
  - G. No progress payments will be made for Substantial Completion until all required submittals have been submitted and accepted by the AUTHORITY.

#### **1.04 SUBSTANTIAL COMPLETION**

- A. In accordance with Section 00 70 00 - General Conditions, Article 13.10 Substantial Completion, the CONTRACTOR shall notify the AUTHORITY in writing that the Work or a portion of the Work which has been specifically identified in the Contract Documents (except for items specifically listed by the CONTRACTOR as incomplete) is substantially complete and request that the AUTHORITY issue a Certificate of Substantial Completion. The AUTHORITY will consider the CONTRACTOR'S request for Substantial Completion only when:
  1. Written request for Substantial Completion is provided at least 14 calendar days in advance of the AUTHORITY'S scheduled Substantial Completion inspection date.
  2. List of items to be completed or corrected is submitted.
  3. All Operation and Maintenance Manuals are submitted and approved by the AUTHORITY.
  4. All commissioning requirements have been met.
  5. All equipment and systems have been tested, adjusted, balanced and are fully operational.
  6. All demonstration and training requirements have been met.
  7. All automated and manual controls are fully operational.
  8. Operation of all equipment and systems has been demonstrated to AUTHORITY.
  9. Certificate of Occupancy is submitted.
  10. Certificates of Inspection for required inspections have been submitted.
  11. Project Record Documents for the Work or the portion of the Work being accepted are submitted and approved.
  12. Spare parts and maintenance materials are turned over to AUTHORITY.
  13. All keys are turned over to the AUTHORITY.
  14. All warranties and bonds are submitted and approved.
  15. Final cleaning has been completed to the satisfaction of the AUTHORITY.
- B. When all of the preceding requirements for the consideration of Substantial Completion have been met, the AUTHORITY will conduct a scheduled Substantial Completion inspection with

its Architect/Engineers and Using Agency representatives. If upon the completion of the inspection, the AUTHORITY should find that the Work is not substantially complete, AUTHORITY will promptly notify CONTRACTOR in writing, listing observed deficiencies.

- C. The CONTRACTOR shall remedy deficiencies and send a second written notice of Substantial Completion.
- D. When the AUTHORITY finds the Work is substantially complete, it will have 14 days to issue a certificate of Substantial Completion with an attached punch list of deficiencies, all in accordance with the provisions of the General Conditions.
- E. The CONTRACTOR shall be responsible for scheduling the activities required for Substantial Completion to enable completion within the Contract Time.

#### **1.05 FINAL COMPLETION**

- A. In accordance with Section 00 70 00 – General Conditions, Article 13.13 Final Completion, when the CONTRACTOR considers that it has completed all the deficiencies listed on the Substantial Completion punch list, and that the Work is otherwise complete, it shall submit written certification that:
  - 1. Contract Documents have been reviewed
  - 2. Work has been completed in accordance with Contract Documents, and deficiencies listed with certificate of Substantial Completion have been corrected
  - 3. Work is complete and ready for final inspection
- B. Upon the receipt of the preceding written notice, the AUTHORITY will conduct a Final Completion inspection. If the AUTHORITY should then find the Work to be incomplete, it will promptly notify the CONTRACTOR in writing with a list of observed deficiencies.
- C. The CONTRACTOR shall remedy deficiencies and transmit to the AUTHORITY a second certification of Final Completion.
- D. When the AUTHORITY determines the Work is complete, all in accordance with the General Conditions article, “Final Completion and Application for Payment”, the CONTRACTOR may make application for Final Payment.

#### **1.06 REINSPECTION FEES**

- A. In accordance with Section 00 70 00 – General Conditions, Articles 13.10 Substantial Completion and 13.12 Final Inspection, the CONTRACTOR shall pay for all costs incurred by the AUTHORITY for re-inspection.
- B. The AUTHORITY may deduct the re-inspection costs from the application for final payment.

#### **1.07 FINAL ACCEPTANCE**

- A. Following the issuance of Final Completion, and subject to the completion of requirements specified in Section 00 70 00 - General Conditions, Articles 13.14 Final Payment and 13.15

Final Acceptance, the AUTHORITY will review the project files for completeness. The AUTHORITY may require the CONTRACTOR to submit or re-submit any of the following documents, upon request:

1. Contractor's transmittal letter: O&M Manuals
  2. Contractor's transmittal letter: Warranty/Bonds
  3. Contractor's transmittal letter: Record Documents
  4. Spare parts, maintenance materials receipts
  5. Contractor's transmittal letter: keys & keying schedule
  6. Contractor's certification of insurance
  7. EEO compliance certification (Federally funded projects only)
  8. Submittals and miscellaneous registers
  9. Original final pay estimate
  10. Contractor's release
  11. Department of Labor Notice of Completion (NOC)
  12. Other documentation as required by the AUTHORITY
- B. Statement of Adjustment of Accounts – The AUTHORITY may require the CONTRACTOR to submit a final statement reflecting adjustments to the Contract Price showing:
1. Original Contract Price
  2. Previous Change Orders
  3. Changes under allowances
  4. Changes under Unit Prices
  5. Deductions for uncorrected Work
  6. Penalties and bonuses
  7. Deductions for liquidated damages
  8. Deductions for re-inspection fees
  9. Other adjustments to Contract Price
  10. Total Contract Price as adjusted
  11. Previous payments
  12. Sum remaining due
- C. AUTHORITY will issue a final Change Order reflecting all remaining adjustments to Contract Price not previously made by Change Orders.
- D. See Section 01 29 73 - Schedule of Values for minimum value that shall be assigned for Final Acceptance.
- E. The CONTRACTOR shall cooperate with the AUTHORITY and shall provide the requested documentation.
- F. When the AUTHORITY determines its files are complete, it may make final payment and issue a letter of Final Acceptance.

**PART 2 - PRODUCTS**

**Not Used**

**PART 3 - EXECUTION**

**Not Used**

END OF SECTION

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**SECTION 01 78 39  
PROJECT RECORD DOCUMENTS**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Maintenance of Record Documents and Samples
- B. Submittal of Record Documents and Samples

**1.02 RELATED REQUIREMENTS**

- A. Section 00 70 00 - General Conditions: Record Documents
- B. Section 01 11 13 – Summary of Work: Record survey
- C. Section 01 29 76 – Application for Payment
- D. Section 01 33 23 – Shop Drawings, Product Data, and Samples
- E. Section 01 77 00 – Contract Closeout Procedures
- F. Individual Specifications Sections: Manufacturer's certificates and certificates of inspection

**1.03 MAINTENANCE OF DOCUMENTS AND SAMPLES**

- A. In addition to requirements in General Conditions, maintain at the site for AUTHORITY one accurate record copy of:
  - 1. Contract Drawings
  - 2. Specifications
  - 3. Addenda
  - 4. Change Orders and other modifications to the Contract
  - 5. Reviewed Shop Drawings, product data, and samples
  - 6. Survey and field records
  - 7. Field test records
  - 8. Inspection certificates
  - 9. Manufacturer's certificates
- B. Prior to Substantial Completion, provide original or legible copies of each item maintained by CONTRACTOR as listed in 01 78 39.1.02.B,C, and D above.
- C. Delegate responsibility for management of maintenance of Record Documents to one person on CONTRACTOR's staff as approved in advance by Contracting Officer.
- D. Promptly following award of Contract, secure from AUTHORITY, at no cost to the CONTRACTOR, one complete set of all Documents comprising the Contract.

- E. Immediately upon receipt of job set described above, identify each Document with title "RECORD DOCUMENTS - JOB SET".
- F. Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage for record documents and samples.
- G. Label and file record documents and samples in accordance with section number listings in table of contents of this Project manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
- H. Maintain record documents in a clean, dry and legible condition. Do not use record documents for construction purposes.
- I. Use all means necessary to maintain job set of Record Documents completely protected from deterioration and from loss and damage until completion of Work and transfer of recorded data to Contracting Officer.
- J. Keep record documents and samples available for inspection by AUTHORITY.
- K. Upon request by the AUTHORITY and at time of each Application for Payment enable inspection of record documents by the AUTHORITY for review as to completeness.
- L. Contracting Officer's approval of current status of Record Documents will be prerequisite to Contracting Officer's approval of requests for progress payments and request for final payment.
  - 1. Prior to submitting each request for progress payment, secure Contracting Officer's approval of Record Documents as currently maintained.
  - 2. Prior to submitting request for Final Payment, obtain Contracting Officer's approval of final Record Documents.
- M. Do not use job set for any purpose except entry of new data and for review and copying by Contracting Officer.

#### **1.04 RECORDING**

- A. Record Drawings to be provided electronically with clouds around deviations from issued for construction (IFC) documents.
- B. Thoroughly coordinate all changes within Record Documents, making adequate and proper entries on each Specification Section and each sheet of Drawings and other Documents where such entry is required to properly show change or selection.
- C. When a change within Record Documents is referenced to another document, such as a RFI, Shop Drawing or Change Order, attach a copy of the referenced document to the respective Record Drawing or Record Specification where the entry is made.
- D. Contract Drawings and Shop Drawings: Legibly mark each item to record actual construction, including:

1. Measured depths of elements of foundation in relation to finish first floor datum. Accurate to the nearest inch.
  2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements. Accurate to the nearest inch.
  3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of construction.
  4. Field changes of dimension and detail.
  5. Changes made by modifications.
  6. Details not on original Contract Drawings.
  7. References to related Shop Drawings and modifications
  8. Clearly label all changes and show dimensions to establish size and location. All identifications shall be sufficiently descriptive to relate reliably to Specifications.
- E. Other Documents: Maintain manufacturer's certifications, inspection certifications, and field test records required by individual Specifications sections.

**1.05 SUBMITTALS**

- A. Upon submittal of the completed Record Documents, make changes in Record Documents as required by the Contracting Officer.
- B. Transmit with cover letter in duplicate, listing:
1. Date
  2. AUTHORITY's Project title and number
  3. CONTRACTOR's name, address, and telephone number
  4. Number and title of each record document
  5. Signature of CONTRACTOR or authorized representative.
- C. Final Record Documents shall include both hard copies and digitally scanned copies in .pdf format (high quality greyscale scans, minimum 200 pixels/inch). Scans shall include front and back of drawings/documents where information occurs on both sides.

**PART 2 – PRODUCTS**

**Not Used**

**PART 3 - EXECUTION**

**Not Used**

**END OF SECTION**

**SECTION 01 91 00  
COMMISSIONING**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Commissioning (Cx) objectives and scope
- B. Definitions of Cx team members
- C. Definitions of Cx terminology
- D. Description of the Cx process
- E. Sample Cx Master Equipment and Systems Log
- F. Sample PC/FC checklists

**1.02 RELATED REQUIREMENTS**

- A. Section 00 70 00 - General Conditions
- B. Section 01 29 73 – Schedule of Values
- C. Division 11 – Equipment
- D. Divisions 20, 21, 22, 23 and 25 – Mechanical
- E. Divisions 26, 27 and 28 - Electrical

**1.03 REFERENCES**

- A. ANSI/NETA ATS Standard for Acceptance Testing Specifications for Electrical Power Equipment and Systems latest Edition.
- B. ANSI/NETA ECS Standard for Electrical Commissioning Specifications for Electrical Power Equipment and Systems latest Edition.
- C. ANSI/NETA MTS Standard for Maintenance Testing Specifications for Electrical Power Equipment and Systems latest Edition.

**1.04 SCOPE**

- A. Provide comprehensive (Level 2) Cx, as defined by reference A, for the systems, subsystems and equipment as identified in Division 26 using the Cx process outlined by this section.
- B. Complete the following Cx objectives to the satisfaction of the Commissioning Authority (CxA):

1. Furnish, install, adjust, operate and test systems, subsystems and equipment to meet the design intent of the Contract Documents
2. Thoroughly document the installation, starting, and testing of the systems, subsystems and equipment.
3. Provide neatly annotated installation, operation and maintenance manuals (IO&Ms) which accurately reflect the actual systems, subsystems and equipment configurations installed.
4. Provide complete Project Record Documents which accurately reflect the actual installation of systems, sub systems and equipment.
5. Formally train the AUTHORITY's maintenance staff such that they are made familiar with the operation and maintenance requirements of the systems, subsystems and equipment through effective training.
6. Fully document maintenance staff training.
7. Coordinate the Cx process with all parties involved in the project in order to maintain Project Schedule, Documentation, and Quality Control.
8. Complete Cx activities prior to Project Closeout.

#### **1.05 DEFINITIONS**

- A. Commissioning Authority (CxA): The person(s) or company responsible, on the AUTHORITY's behalf, for verifying that the Cx process is properly executed and completed in accordance with the Contract Documents. The CxA reviews and approves the scope, planning, scheduling, execution, documentation, training and final completion of the overall Cx process. The CxA works directly for the AUTHORITY's Representative's Project Manager.
- B. Contractor's Commissioning Representative (CCR): The Contractor's Representative responsible for planning, scheduling, managing, executing and documenting the required Cx activities. The CCR must be experienced in basic design, operation, installation and testing of HVAC and electrical systems and must have strong administrative, planning, organizational and communication skills. The primary duty of the CCR is to oversee the Cx process. The CxA approves the selection of the CCR.
- C. Contractor's Cx Team: Members of the Contractor's team responsible for Cx activities. These team members include, but are not limited to:
  1. The CCR and designated support staff
  2. Mechanical and electrical coordinators
  3. Subcontractors
  4. Sub-subcontractors
  5. Product/System Vendors
  6. Manufacturer's Representatives
- D. Cx Master Equipment and System Log: A tabulated list of equipment and systems that are required to be commissioned as identified in Division 26 of the specifications. A sample log is provided in Part 3 of this section.

- E. Pre-Functional Installation Checklist (PC): A list of equipment inspections and elementary component tests required for verification of proper installation of equipment. Pre-functional checklist items include static inspections and procedures to prepare the equipment or system for initial operation (e.g., belt tension, oil levels OK, labels affixed, gages in place, sensors calibrated, etc.) and simple testing of component or system function, (such as measuring the voltage imbalance on a three phase pump motor of a chiller system). Pre-functional checklists augment and are combined with the manufacturer's start-up checklist. The CCR field verifies that the pre-functional checks take place. The AUTHORITY's Representative and CxA may elect to witness the execution of selected parts of the PC.
- F. Functional Performance Test (FT): Systematic testing of the dynamic function and operation of equipment and systems using direct observation and monitoring equipment methods. Functional testing includes dynamic testing of systems under full operation, including interaction with related systems (e.g., the chiller pump is tested interactively with the chiller functions to see if the pump ramps up and down to maintain the differential pressure set point). Systems are tested under various modes, such as during low cooling or heating loads, high loads, component failures, unoccupied, varying outside air temperatures, fire alarm, power failure, etc. The systems are run through the control system's sequences of operation and components are verified to be responding as stated in the sequences. Functional Performance Tests are performed after PCs, equipment startups, and Testing, Adjusting and Balancing (TAB) are complete.
- G. Functional Performance Test Checklist (FC): A list of performance tests required to document the proper performance of the dynamic function and operation of equipment and systems using direct observation and monitoring equipment methods. The CCR and the AUTHORITY's Representative field verify that the FTs take place. The CxA will witness the execution of selected parts of the FT. The AUTHORITY's Representative may elect to witness the execution of selected parts of the FT.
- H. Deferred Functional Tests: FTs that are performed later, after substantial completion, due to partial occupancy, equipment, seasonal requirements, design or other site conditions that disallow the test from being performed at an earlier date. Only those functional tests pre-approved by the AUTHORITY's Representative and the CxA may be deferred.
- I. Functional Completion: Completion of the Cx activities required by the Contract Documents prior to Substantial Completion, as defined in Section 00 80 00 – Supplemental General Conditions of the Construction Contract.
- J. Phased Cx: Cx that is completed in phases (by floors or areas, for example) due to the size of the systems or other scheduling issues, in order minimize total construction time.

## **1.06 CX PROCESS**

- A. Cx Master Equipment and System Log:
  - 1. Within ninety (90) days after receipt of conformed documents, the CxA will provide the Cx Master Equipment and System Log to the CCR.

2. The CxA will advise the CCR regarding any reorganization and/or reformatting of the Cx Master Equipment and System Log to support construction.
- B. Construction Schedule:
1. The CCR shall incorporate the items from the Cx Master Equipment and System Log into the Construction Schedule.
  2. Use Phased Cx when possible to improve construction efficiency.
  3. See Section 01 32 00 – Work Schedules and Reports.
- C. Schedule of Values:
1. The CCR shall incorporate the items from the Cx Master Equipment and System Log into the Schedule of Values.
  2. See Section 01 29 73 – Schedule of Values.
- D. Cx Meetings:
1. The CCR shall plan, schedule, coordinate, and attend the Cx meetings. The CCR shall record and maintain the minutes for each meeting. The CxA will conduct each meeting.
  2. Within thirty (30) days after award of the Contract, hold an initial Cx meeting at the job site. All members of the Cx team shall be present at the meeting. The purpose of the meeting is to:
    - a. Identify the Cx team members and provide contact information.
    - b. Provide an overview of the Cx process.
    - c. Discuss administrative requirements, responsibilities and scheduling.
    - d. Discuss the status of the Cx Master Equipment and System Log.
  3. Hold a regularly scheduled Cx status meeting every month. The CxA and the AUTHORITY's Representative will be present at each meeting. Additional members of the Cx team shall attend these meetings as directed by the CCR.
- E. Installation, Operation and Maintenance Data:
1. Upon approval of Submittals, the CCR shall oversee the timely preparation and submission of product installation, Operation and Maintenance Data, pre-functional installation examination checklists and functional performance test checklists in accordance with the Construction Schedule and Section 01 33 00 – Submittal Procedures.
  2. The AUTHORITY's Representative will approve the installation, Operation and Maintenance Data and checklists for conformance to the design intent.
  3. The CxA will provide final approval for installation, Operation and Maintenance Data and associated checklists for completeness and suitability to support Cx activities.
  4. See 01 78 39 – Project Record Documents.
- F. Cx Binders:

1. The CCR shall maintain the master copy of the approved installation, Operation and Maintenance Data and checklists. Neatly arrange and label the data by specification section in the Cx binders. Include a copy of the Cx Master Equipment and System Log at the front of the binders. Annotate this log to accurately reflect the status of completeness.
2. The CxA will periodically review the master Cx binders.
3. The CxA will maintain a second copy of the approved installation, Operation and Maintenance Data and the checklists. This copy will serve as the formal O&M manual submittal to the AUTHORITY's Representative.

**G. Equipment Installation:**

1. The CCR provides written approval prior to the start of installation for each item listed on the Cx Master Equipment and System Log. Equipment shall not be installed unless approved installation, Operation and Maintenance Data, and PC and FC forms are on file in the master Cx binders.
2. The CCR updates the Construction Schedule to indicate actual installation start date.
3. The installer obtains a copy of the installation information and PC from the CCR. The equipment is installed using a copy of the approved installation instructions and the associated PC.
4. The installer signs off each step of the PC and submits the completed PC to the subcontractor responsible for the work.
5. The subcontractor reviews the PC, physically verifies that the equipment is properly installed and signs the subcontractor review block of the PC.
6. The CCR reviews the PC provided by the subcontractor, observes the work and signs the CCR review block.
7. The CCR files the completed PC in the Cx binder and signs off the Cx Master Equipment and System Log to indicate the equipment is installed.
8. The CCR updates the Construction Schedule to indicate that the equipment installation is complete.
9. The CCR forwards a copy of the completed PC to the CxA.
10. The CxA files the PC in the CxA copy of the Cx binders.

**H. Training Material:**

1. Upon approval of installation, Operation and Maintenance Data and checklists, the CCR shall oversee the formulation of training topics and associated syllabi and training material to support the items on the Cx Master Equipment and System Log.
2. The AUTHORITY's Representative will approve training topics for conformance to the design intent.
3. The CxA will provide final approval of training topics for suitability to support Cx.
4. The CCR shall maintain the master copy of the training syllabi and training material. Neatly arrange and label by specification section and/or system the information in the training binders. Provide a table of contents which lists the training topics and current status of training material approval. The CxA will periodically review the master training binders.



5. The CCR shall update the Construction Schedule to indicate status of training material approval.
6. The CxA will maintain a second copy of the approved training material. This copy will serve as the formal training documentation submittal to the AUTHORITY's Representative.

I. Functional Performance Testing:

1. The CCR provides written approval prior to the start of functional testing for each item listed on the Cx Master Equipment and System Log. Functional testing of equipment is not allowed unless the approved PC has been completed and is on file in the master Cx binder.
2. The CCR updates the Construction Schedule to indicate the actual functional testing start date.
3. The equipment or system is functionally tested using a copy of the approved installation, Operation and Maintenance Data and FC.
4. The operator obtains a copy of the approved installation, Operation and Maintenance Data and FC from the CCR. The operator signs off each step of the FC and forwards the completed FC form to the applicable subcontractor responsible for the work.
5. The subcontractor reviews the FC, physically verifies proper equipment operation with the operator and signs the subcontractor review block of the FC and informs the CCR that the equipment FC is complete and the equipment is ready for final checkout.
6. The CCR informs the CxA that the equipment is ready for final checkout and provides a date and time for a site visit observation of the operating equipment (48 hours minimum notification time is required).
7. The CxA will notify the AUTHORITY's Representative and arrangements will be made to include maintenance staff personnel at final equipment checkouts as much as possible to support effective field training.
8. Upon satisfactory completion of the final checkout, the CCR and CxA shall sign appropriate review blocks of the FC.
9. The CCR files the completed FC in the Cx binder and signs off the Cx Master Equipment and System Log to indicate that equipment functional tests for that item are complete.
10. The CCR updates the Construction Schedule to indicate that the equipment functional testing is complete.

J. Training:

1. Upon approval of training topics and training material and the actual installation status of equipment, the CCR shall review and modify the construction schedule as necessary to maintain an up-to-date training schedule. Training shall not be given on a piece of equipment until functional testing for the equipment is satisfactory completed and the completed FC is on record in the Cx binder.
2. The CxA will review and approve the training schedule.
3. The CCR shall issue a training notice two (2) weeks prior to the scheduled training session. Disseminate the notice via e-mail, fax or other method as approved by the CxA.

4. Include the following information in the notice:
    - a. Training topic
    - b. Instructor name and contact telephone number and e-mail address
    - c. Date, time, location, duration
  5. The CCR shall monitor the training topics, verify that the training occurs and effectively covers all training topics indicated on the syllabi.
  6. The CCR shall verify that a written training record is completed for each topic which includes the following:
    - a. Training topic
    - b. Date and time of training
    - c. Instructor name, title and contact information
    - d. Attendance list
    - e. Signature of instructor indicating that each item identified in the syllabi was effectively covered during the training session
    - f. CCR signature indicating that the training was effective.
  7. The CCR shall forward a copy of the completed training report to the CxA for review and approval.
  8. The CxA will approve and file the completed training record in the CxA copy of the training binders. The CxA may elect to observe any or all training sessions to verify effectiveness.
- K. Record Drawings:
1. The CCR shall oversee the maintenance of master “as-built” mark-ups of the Contract Documents as the work progresses. To accurately reflect actual installation conditions, document addendum items, field changes, and installation modifications on the “as-built” mark-ups. Update the master “as-built” mark-ups a minimum of once a week.
  2. The AUTHORITY’s Representative will review the “as-built” mark-ups during each site visit and provide a specific comment on each field report indicating the status of “as-built” drawings with regard to completeness and design intent.
  3. Upon completion of construction, the “as-built” drawings shall be drafted using AutoCAD to produce the project Record Drawings.
  4. The CCR shall verify that the completed Record Drawings accurately reflect the constructed project and forward to the CxA for final approval.
  5. The CxA will review the Record Drawings for final approval.
  6. See 01 78 39 – Project Record Documents.

**PART 2 – PRODUCTS**

**Not Used**

**PART 3 - EXECUTION**

**3.01 COMMISSIONING MASTER EQUIPMENT AND SYSTEMS LOG (SAMPLE)**

A. The following sample Cx Master Equipment and Systems Log is provide to show general format only and does not include all the equipment and systems to be commissioned. Refer to Divisions 11, 20, 21, 22, 23. 25, 26, 27 and 28 for specific systems, subsystems and equipment to be commissioned.

**3.02 COMMISSIONING MASTER EQUIPMENT AND SYSTEMS LIST**

PRODUCTS	System/Equipment Tag	System/Equipment Description	Equipment Submittal Approved	I/O&M Approved	PC and FT Checklists Approved	Training Syllabus Approved	PC Completed	FT Completed	Training Completed
<b>Division 11 - Equipment</b>									
1									
2									
3									

<b>Divisions 26 - Electrical</b>									
72									
73									
74									

**3.03 COMMISSIONING PRE-FUNCTIONAL INSTALLATION (PC) AND FUNCTIONAL PERFORMANCE TEST (FC) CHECKLISTS (SAMPLES)**

A. The following sample Cx checklists are provide to show general format only and do not include all the equipment and systems to be commissioned. Refer to Divisions 26 for specific systems, subsystems and equipment to be commissioned.

**Pre-Functional Installation Checklist (PC)**

**Air Handling Unit**

PROJECT: _____	UNIT NO: _____	
LOCATION: _____	SERVICE: _____	
MANUFACTURER: _____	MODEL: _____	
ITEM	OK	COMMENT
<u>PRE-START-UP INSPECTION</u>		

Mountings Checked (Shipping Bolts Removed)		
Vibration Isolators Installed		
Seismic Restraints Installed		
Equipment Guards Installed		
Pulleys Aligned and Belt Tension Correct		
Plenums Clear and Free of Loose Material		
Fans Rotate Freely		
Fans, Motors and Linkages Lubricated		
Fire & Balance Dampers Positioned		
Temporary Start-up Filters Installed		
Electrical Connections Completed		
Disconnect Switch Installed		
Overload Heaters in Place (Sized Correctly)		
Heating Coil Clean and Clear – Piping Complete		
Cooling Coil Clean and Clear – Piping Complete		
Condensate Drains Clear		
Humidifier Section Installation Completed		
Safety Controls Operational		
Building & Fan Room Clean For Start-up		
Duct Cleaning Completed		
Control System Completed (End to End Checks)		
Review (Foreman): _____	DATE: _____	
Review (CCR): _____	DATE: _____	
Approved (CxA): _____	DATE: _____	

**Functional Performance Checklist (FC)**

**Air Handling Unit**

PROJECT: _____ LOCATION: _____ MANUFACTURER: _____	UNIT NO: _____ SERVICE: _____ MODEL: _____																									
<b>ITEM</b> <u>START-UP INSPECTION</u> Start-up By Manufacturer's Representative Fan Rotation Correct Electrical Interlocks Verified Fan Status Indicators Verified (Local / Remote) Freeze Protection Operational Local Air Leakage Acceptable Vibration & Noise Level Acceptable Motor Amps – Rated _____ Actual _____ Motor Volts – Rated _____ Actual _____ Final Operating Filters Installed	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:10%;">OK</th> <th style="width:90%;">COMMENT</th> </tr> </thead> <tbody> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </tbody> </table>	OK	COMMENT																							
OK	COMMENT																									
<b>COMMENTS:</b> _____ _____ _____																										
Functional Testing By: _____ Review (Foreman): _____ Approved (CCR): _____ Approved (CxA): _____	DATE: _____ DATE: _____ DATE: _____ DATE: _____																									

**END OF SECTION**

## SECTION 26 05 00 - COMMON WORK RESULTS FOR ELECTRICAL

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. The work under this division includes furnishing all materials, equipment, labor, supervision, tools and items necessary for the construction, installation, connection, testing and operation of all electrical work for this project as shown on the Electrical Drawings specified herein.
- B. Related Work Described Elsewhere: Where other divisions require electrical materials or installations comply with all applicable requirements herein. Provide all electrical materials and installation work required to connect, test and operate equipment required by other divisions. Electrical installations required by other divisions but not shown on the electrical drawings shall be provided.
- C. Itemized Schedule of Costs: Furnish a contract cost breakdown by specification section to the Architect with a copy to the Project Manager to allow evaluation of partial payment requests. Refer to Division 1 for requirements.
- D. Warranty: The Contractor shall guarantee all work installed under this specification and make good, repair or replace at his own expense, any defective work, materials or parts within one year after final acceptance, if, in the opinion of the Project Manager, said defect is due to imperfection in material, design or workmanship. Incandescent lamps are not warranted but all shall be operating at time of final acceptance. Warranty shall be submitted in writing as required in Division 1.

#### 1.3 REGULATIONS

- A. Codes and Ordinances: Comply with all applicable codes, ordinances and regulations including the National Electrical Code, National Electrical Safety Code, NFPA, IBC, IFC, and all other national, state and local codes and ordinances. Notify the Engineer of any non-compliance in contract documents to applicable codes and regulations prior to installation of the work. Changes in the work after initial installation due to requirements of code enforcing agencies shall be at no additional cost to the Owner.
- B. Permits: Provide and pay for all permits and fees required for this project. In addition to paying for all permits and fees, the Contractor shall be responsible for contacting the various Approving Authorities, arranging for review of shop drawings where appropriate, scheduling inspections in a timely manner, and making necessary corrections as required by

the Approving Authorities. No work in connection with an electric wiring system shall be covered or concealed until it has been inspected and approved by the building official.

- C. Approving Authority: It is the Contractor's responsibility to ascertain and contact the appropriate "Approving Authorities" for this project. Approving Authorities will include, but not be limited to the Ketchikan Building Official.
- D. Certificate of Inspection: Obtain a Certificate of Electrical Inspection from the local inspecting authority indicating final acceptance. Submit to the Owner upon completion of the project as part of project closeout.
- E. Safety Measures to be Taken: The Engineer has not been retained or compensated to provide design and construction review services relating to the Contractor's safety precautions or to means, methods, techniques, sequences or procedures required for the Contractor to perform his work. The Contractor will be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours. The duty of the Engineer to conduct construction observations of the Contractor's performance is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.

#### 1.4 DRAWINGS AND SPECIFICATIONS

- A. Intent: The Electrical Drawings and specifications are intended to include all labor and materials necessary to provide a complete and operating facility. Any materials shown and called for on the drawings but not mentioned in the specifications, or vice versa, which are necessary for the proper completion of the installation or operation of the equipment, shall be furnished the same as if specifically called for in both. By submitting a bid, the Contractor is acknowledging that he has made a thorough examination of the contract documents, existing site conditions, and has determined that these documents and conditions do sufficiently describe the scope of construction work required under this contract. Any questions regarding interpretation of the contract documents shall be made in writing in a timely manner prior to the bid date to allow reasonable time for resolution of the questions.
- B. Diagrammatic Drawings: The Electrical Drawings are diagrammatic and do not show exact or complete raceway and wiring configurations, routing, rating or the necessary number and types of raceway fittings or pull boxes. Provide all labor and materials required to execute the work. Coordinate exact location of all devices and raceways with the work of all other trades.

#### 1.5 SUBMITTALS AND SHOP DRAWINGS

- A. It is the Contractor's responsibility to thoroughly review vendor-assembled shop drawings, catalog cuts, etc. to ensure that these documents are complete and comply with the specifications.
- B. Submittal Format: Submittals must be sent in complete "sets," including all specified material. Submission of individual materials will not be accepted.

- C. Review: The review of a manufacturer's name or product does not relieve the Contractor of the responsibility for providing materials and equipment which comply in all details with the requirements of the contract documents. Contractor shall be solely responsible for submitting materials at such a time to allow a minimum of two weeks for Engineer's review.

## 1.6 OPERATIONS AND MAINTENANCE MANUALS

- A. Prepare operations and maintenance manuals for all electrical equipment installed on this project. Refer to Division 01, "Contract Closeout."
- B. Provide table of contents at front of manual indicating general content of each section. Provide index for each section of the manual with complete equipment catalog item or identification.
- C. The information and diagrams included must be on the specific equipment installed for this project. General "product line" information is not acceptable. The equipment model and catalog numbers with appropriate prefixes and suffixes must be clearly indicated on the data sheets. Manuals shall contain shop drawings, schematic and wiring diagrams (showing all external connections), parts lists, operating and maintenance information. Any modifications to equipment in the field shall be updated on the drawings, diagrams, etc., to reflect the "as-built" conditions.
- D. Bind with three-screw post-type binder with heavy-duty hardboard cover and cloth backing. Imprint the edge of volume with name of the project, year of completion and the words "Electrical Equipment." Front of manual shall be imprinted with the words "Electrical Equipment" the name of the project, the name of the Owner, year completed, name of the Architect, Engineer and Contractor. All printing in gold lettering. If the thickness of the manual exceeds approximately 2", provide separate volumes, each approximately 2" thick with each volume imprinted as described above and with the addition of the volume number.
- E. One preliminary copy shall be submitted to the Engineer for review 30 days prior to completion of the project. Preliminary copy shall include proposed wording for cover and back edge of the manual. Submit final bound copies for distribution as required in Division 1.

## 1.7 RECORD DRAWINGS

- A. A record shall be made during the progress of the project indicating the work as actually installed. Corrections and changes shall be kept up to date at all times on a separate set of record drawings kept at the job site for review. Mark-ups may be schematic as related to interior raceway systems; however, all raceways shall be shown in proper relationship with junction boxes, panelboards, devices, and equipment. Raceways installed below grade shall be shown with both horizontal and vertical dimensions at an accuracy of  $\pm 6$  inches.
- B. Project Closeout: At completion of the project, the Contractor shall provide as-built drawings indicating work as revised, detailed and actually installed. Submit to the Project Manager as specified in Division 1.



## 1.8 DEFINITIONS

- A. Provide: To furnish and install.
- B. Wiring: Raceway, conductors and connections.
- C. Exposed: Visible from occupied areas.
- D. Install: To set in position and make fully operational.
- E. Furnish: Purchase and deliver to the job site.
- F. Required: As required by code, authority having jurisdiction or contract documents for the system and/or installation to be fully operational.

## 1.9 COORDINATION

- A. Utilities Services:
  - 1. Scope: It shall be the Contractor's responsibility to contact all utility companies including, but not limited to, KPU and verify the extent of the service work to be performed by the Contractor and by the utilities regardless of what is shown on the drawings in order to provide a complete electrical service. Portions of the service shall be provided by the Electrical Contractor and part by the serving utilities. Coordination with the various utility companies is the sole responsibility of the Contractor.
  - 2. Service Charges: All utility service charges will be paid for by Owner.
  - 3. Application for Services: It shall be the Contractor's responsibility to complete and submit all required applications for service with the various companies. Coordination and scheduling new services with the various utility companies is the sole responsibility of the Contractor.
- B. Work of Other Trades: The Electrical Drawings do not show complete details of the building construction. Refer to the Structural and Civil Drawings for those details which may affect the execution of this work. Specific locations of construction features shall be obtained from the reference drawings, field measurements, or the trade providing the material or equipment. No extra payments will be allowed for failure to obtain this information.
- C. The Contractor will not be paid for work requiring reinstallation due to lack of coordination prior to installation such as removing and replacing, relocating, cutting, patching or finishing.

## PART 2 - PRODUCTS

### 2.1 STANDARD OF QUALITY

- A. General: Whenever any material or equipment is specified by patent or proprietary name or by the name of the manufacturer, such specification shall establish the minimum standard of quality in that particular field of manufacture. The engineer shall be the sole and final judge as to quality and acceptability of substitutions, no exceptions.

## 2.2 PRODUCT LISTING AND LABELING

- A. All electrical equipment shall be listed and labeled by Underwriters Laboratories or another Nationally Recognized Testing Laboratory (NRTL). Equipment in compliance with NRTL standards but not bearing their label is not acceptable. If the manufacturer cannot arrange for labeling of an assembled unit at the factory, the necessary inspection and acceptance by the testing facility shall be performed in the field at no additional cost to the Owner and be acceptable to the authority having jurisdiction.

## 2.3 SLEEVES FOR RACEWAYS AND CABLES

- A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

## 2.4 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. All materials shall be new, free from defects and arrive at the job site in their original unopened container.

### 3.2 MATERIAL STORAGE

- A. Make all necessary provisions for storing materials and equipment at site so as to insure the quality and fitness of the items to be incorporated in the work. Equipment shall be stored to prevent damage and corrosion per manufacturer.

### 3.3 INTERRUPTION OF EXISTING ELECTRICAL SERVICE

- A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the conditions outlined in Division 1.

### 3.4 EXISTING CONDITIONS

- A. General: Specific scope of demolition work and operating conditions to be encountered shall be verified by on-site review prior to submitting bid. Demolition work in general is noted or shown on the documents based upon available "drawings of record" and may not show the actual conditions as they presently exist. The Contractor shall be responsible for removing or modifying the existing electrical installation as required by the building altera-

tions. The Contractor shall be responsible for protection of existing equipment and wiring to be retained or reinstalled and shall replace any equipment damaged during the process of removal and reinstallation.

- B. Re-use of existing conduit: Existing conduit is to be re-used to maximum extent practical. Prior to the re-use of any conduit, it shall be cleaned with a wire brush mandrel and proofed with a polyurethane or steel mandrel with a diameter of at least 70% of the inside diameter of the conduit. The mandrel shall be passed through the entire conduit run without binding. Provide test report for each pull documenting time, date, person's present, description of conduit run being tested, description of equipment, test results, and approximate locations of obstructions or anomalies. If a conduit fails the proof test, contact Engineer for repair and follow up testing instructions. Do not install wiring in the conduit until repairs and re-testing have been completed at the Owner's cost.

### 3.5 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

- A. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

### 3.6 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Electrical penetrations occur when raceways, cables, wireways, cable trays, or busways penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.
- B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.
- C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
- D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.
- E. Cut sleeves to length for mounting flush with both surfaces of walls.
- F. Extend sleeves installed in floors 2 inches above finished floor level.
- G. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable, unless indicated otherwise.
- H. Seal space outside of sleeves with grout for penetrations of concrete and masonry pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.
- I. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

### 3.7 FIRESTOPPING

- A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for electrical installations to restore original fire-resistance rating of assembly.

### 3.8 CUTTING AND PATCHING

- A. Provide all cutting, demolition and patching required for the installation of the electrical work on this project. Patching shall be accomplished by utilizing the general construction trades normally providing materials and labor needed for restoration of floor, ceiling or walls. Penetrations through existing structural walls, ceiling or floor slabs shall be core drilled. Spillage from core drilling shall be contained by diking, vacuuming and covering with protective plastic sheeting as required. In no case shall structural members be penetrated without prior approval of the Architect. After installation of raceways, provide approved fire sealing materials to close spaces around raceways.

### 3.9 PAINTING

- A. Touch up electrical equipment with factory finished surfaces as required using factory furnished paint. Coordinate field painting requirements with the Architect prior to final trim and cover installation. Do not paint screw heads, hinges, nameplates, hardware, etc. All surface-mounted raceways in finished areas will be painted as directed under the "Painting" division of the specifications.

### 3.10 CLEANING

- A. Promptly remove waste material and rubbish resulting from electrical work. Prior to energizing equipment, remove all chipping materials, construction dirt and debris, vacuum and wipe-down all internal areas. At completion of the project, clean all equipment and fixtures installed under this Contract.

### 3.11 CONSTRUCTION OBSERVATION AND FINAL ACCEPTANCE

- A. Site Review: On-site meetings or reviews of construction by the Engineer shall not be construed as acceptance by these parties as related to quantities, rough-in locations, and compliance with code enforcing authorities.
- B. Testing: The Contractor shall test all wiring and all electrical equipment to verify absence of grounds and short circuits and verify proper operation, rotation, and phase relationship. Contractor will be responsible for scheduling of tests and demonstrations at times mutually acceptable to the Owner. All equipment shall be demonstrated to operate in accordance with the requirements of this specification and the manufacturer's recommendations. Operate every device manually and automatically in accordance with its purpose. Tests shall be performed in the presence of the Owner or his designated representative. All instruments and personnel required to conduct the test shall be provided by the Contractor. Any test not witnessed by the Owner shall be waived by written document. All such documents must become the property of the Owner upon completion of construction.

3.12 INSTRUCTION FOR OWNER’S PERSONNEL

- A. Scope: Following initial operation of all electrical equipment and prior to acceptance of the electrical work, conduct demonstrations of equipment operation and instruction periods for the Owner's representatives.
- B. Instruction Periods: Shall include preliminary discussion and presentation of information from maintenance manuals with appropriate references to drawings, followed by tours of equipment spaces explaining maintenance requirements, access methods, servicing and maintenance procedures, settings and available system and equipment adjustments.
- C. Contractor's representatives, in general, who conduct these instructions and demonstrations shall be qualified foremen or superintendents acquainted with this project and from the trade involved. For major equipment, the representative shall be the manufacturer's representatives with operating experience and substantial design experience on this project. Their qualifications shall be submitted to the Architect and Engineer before conducting the instruction period.
- D. Minimum Duration of Instruction Periods:
  - 1. Electrical Distribution System: 8 hours.
- E. Scheduling of Instruction Periods: Provide notice of Contractor's readiness to conduct such instruction and demonstration periods to the Owner at least two weeks prior to each instruction period and reach agreement on the date of each instruction period.
- F. Prepare a written statement of acceptance for the Owner's signature. The statement shall be substantially as follows:

"I (the Contractor), the associated factory representatives and the subcontractor, have thoroughly tested each of the following systems and have proved their normal operation to the Owner's representative and have instructed him in the operation and maintenance thereof."

<b>Owner’s System</b>	<b>Demonstrator</b>	<b>Representative</b>	<b>Date</b>
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<u>Electrical Distribution</u>			
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<u>Owner's Representative</u>			
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<u>Electrical Contractor</u>			
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- G. Send copies of this acceptance to the Project Manager and the Engineer and place one copy in each maintenance manual.
- H. Completion of Work: When requesting final inspection, provide ten-day notice. Submit written certifications that the work has been fully completed in strict accordance with the plans and specifications.

3.13 FINAL ACCEPTANCE

- A. The Electrical Contractor shall submit to the Project Manager a Project Closeout Form (form at end of this section) properly filled out prior to the time final acceptance of the electrical work is requested. At this time also submit copies of final inspection certificates and receipts for loose materials (spare wiring devices, fuses, etc.) turned over to the Owner.

**JOB CLOSEOUT FORM**

1. Electrical Inspector's Final Acceptance:

- Copy of certificate attached.
- Transmitted previously to \_\_\_\_\_  
Date

2. As-Built Drawings:

- Attached
- Transmitted previously to \_\_\_\_\_  
Date

3. O & M Manuals

- Attached
- Transmitted previously to \_\_\_\_\_  
Date

4. Spare Parts:

- Delivered to \_\_\_\_\_  
Date

Note: Provide separate letter of transmittal with itemized list of parts for each set of spare parts. Each transmittal must be signed by an authorized representative of the Owner.

5. Testing and Owner Training:

- Copy of written certification attached.
- Transmitted previously to \_\_\_\_\_  
Date

6. The work is complete in accordance with the contract documents and authorized changes except for the following (attach a separate sheet):

\_\_\_\_\_  
Electrical Contractor Date

\_\_\_\_\_  
General Contractor Date

END OF SECTION 26 05 00

## SECTION 26 05 13 - MEDIUM-VOLTAGE CABLES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes cables and related cable splices, terminations, and accessories for medium-voltage (2001 to 35,000 V) electrical distribution systems.

#### 1.3 DEFINITIONS

- A. Jacket: A continuous nonmetallic outer covering for conductors or cables.
- B. NETA ATS: Acceptance Testing Specification.
- C. Sheath: A continuous metallic covering for conductors or cables.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of cable. Include splices and terminations for cables and cable accessories.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Material Certificates: For each type of cable and accessory.
- C. Source quality-control reports.
- D. Field quality-control reports.

#### 1.6 QUALITY ASSURANCE

- A. Installer: Engage a cable splicer, trained and certified by splice material manufacturer, to install, splice, and terminate medium-voltage cable.
- B. Testing Agency Qualifications: Member company of NETA or an NRTL.
  - 1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.



## 1.7 FIELD CONDITIONS

- A. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
  - 1. Notify Construction Manager no fewer than five days in advance of proposed interruption of electric service.
  - 2. Do not proceed with interruption of electric service without Construction Manager's written permission.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Cables:
  - 1. General Cable Corporation.
  - 2. Kerite Co.
  - 3. Okonite Company.
  - 4. Southwire Company.
  - 5. Or approved equal.
- B. Cables Splicing and Terminating Products and Accessories:
  - 1. 3M.
  - 2. Kerite Co.
  - 3. Cooper Power Systems.
  - 4. Raychem.
  - 5. Thomas & Bettis Corporation.
  - 6. Or approved equal.
- C. Source Limitations: Obtain all cables from a single manufacturer.

### 2.2 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with IEEE C2 and NFPA 70.

### 2.3 CABLES

- A. Cable Type: Single conductor type MV-105.
- B. Comply with UL 1072, AEIC CS8, ICEA S-93-639/NEMA WC 74, and ICEA S-97-682.
- C. Conductor: Copper.
- D. Conductor Stranding: Concentric lay, Class B.

- E. Conductor Insulation: Ethylene-propylene rubber.
  - 1. Voltage Ratings: 15 and 35 kV (as indicated).
  - 2. Insulation Thickness: 100 percent insulation level for 15 kV cables. 133 percent insulation level for 35 kV cables.
- F. Shielding: Copper tape, helically applied over semiconducting insulation shield.
- G. Cable Jacket: Sunlight-resistant PVC.

## 2.4 CONNECTORS

- A. Comply with ANSI C119.4 for connectors between aluminum conductors or for connections between aluminum to copper conductors.
- B. Copper-Conductor Connectors: Copper barrel crimped connectors.

## 2.5 SOLID TERMINATIONS

- A. Shielded-Cable Terminations: Comply with the following classes of IEEE 48. Insulation class shall be equivalent to that of cable. Include shield ground strap for shielded cable terminations.
  - 1. Class 1 Terminations: Modular type, furnished as a kit, with stress-relief shield terminator; multiple-wet-process, porcelain, insulator modules; shield ground strap; and compression-type connector.

## 2.6 SEPARABLE INSULATED CONNECTORS

- A. Description: Modular system, complying with IEEE 386, with disconnecting, single-pole, cable terminators and with matching, stationary, plug-in, dead-front terminals designed for cable voltage and for sealing against moisture.
- B. Terminations at Distribution Points: Modular type, consisting of terminators installed on cables and modular, dead-front, terminal junctions for interconnecting cables.
- C. Load-Break Cable Terminators: Elbow-type units with 200-A-load make/break and continuous-current rating; coordinated with insulation diameter, conductor size, and material of cable being terminated. Include test point on terminator body that is capacitance coupled.
- D. Dead-Break Cable Terminators: Elbow-type unit with 600-A continuous-current rating; designed for de-energized disconnecting and connecting; coordinated with insulation diameter, conductor size, and material of cable being terminated. Include test point on terminator body that is capacitance coupled.
- E. Dead-Front Terminal Junctions: Modular bracket-mounted groups of dead-front stationary terminals that mate and match with above cable terminators. Two-, three-, or four-terminal units as indicated, with fully rated, insulated, watertight conductor connection between terminals and complete with grounding lug, manufacturer's standard accessory stands, stainless-steel mounting brackets, and attaching hardware.

1. Protective Cap: Insulating, electrostatic-shielding, water-sealing cap with drain wire.
2. Portable Feed-Through Accessory: Two-terminal, dead-front junction arranged for removable mounting on accessory stand of stationary terminal junction.
3. Grounding Kit: Jumpered elbows, portable feed-through accessory units, protective caps, test rods suitable for concurrently grounding three phases of feeders and carrying case.
4. Standoff Insulator: Portable, single dead-front terminal for removable mounting on accessory stand of stationary terminal junction. Insulators suitable for fully insulated isolation of energized cable-elbow terminator.

## 2.7 SPLICE KITS

- A. Splice Kits: Comply with IEEE 404; type as recommended by cable or splicing kit manufacturer for the application.
- B. Splicing Products: As recommended, in writing, by splicing kit manufacturer for specific sizes, materials, ratings, and configurations of cable conductors. Include all components required for complete splice, with detailed instructions.
  1. Combination tape and cold-shrink-rubber sleeve kit with re-jacketing by cast-epoxy-resin encasement or other waterproof, abrasion-resistant material.
  2. Heat-shrink splicing kit of uniform, cross-section, polymeric construction with outer heat-shrink jacket.
  3. Premolded, cold-shrink-rubber, in-line splicing kit.
  4. Premolded, EPDM splicing body kit with cable joint sealed by interference fit of mating parts and cable.
  5. Separable multiway splice system with all components for the required splice configuration.

## 2.8 MEDIUM-VOLTAGE TAPES

- A. Ethylene/propylene rubber-based, 30-mil splicing tape, rated for 130 deg C operation. Minimum 3/4 inch wide.
- B. Silicone rubber-based, 12-mil self-fusing tape, rated for 130 deg C operation. Minimum 1-1/2 inches wide.
- C. Insulating-putty, 125-mil elastic filler tape. Minimum 1-1/2 inches wide.

## 2.9 ARC-PROOFING MATERIALS

- A. Tape for First Course on Metal Objects: 10-mil thick, corrosion-protective, moisture-resistant, PVC pipe-wrapping tape.
- B. Arc-Proofing Tape: Fireproof tape, flexible, conformable, intumescent to 0.3 inch thick, and compatible with cable jacket.
- C. Glass-Cloth Tape: Pressure-sensitive adhesive type, 1 inch wide.

## 2.10 SOURCE QUALITY CONTROL

- A. Test and inspect cables according to ICEA S-97-682 before shipping.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install cables according to IEEE 576.
- B. Proof conduits prior to conductor installation by passing a wire brush mandrel and then a rubber duct swab through the conduit. Separate the wire brush and the rubber swab by 48 to 72 inches on the pull rope.
  - 1. Wire Brush Mandrel: Consists of a length of brush approximately the size of the conduit inner diameter with stiff steel bristles and an eye on each end for attaching the pull ropes. If an obstruction is felt, pull the brush back and forth repeatedly to break up the obstruction.
  - 2. Rubber Duct Swab: Consists of a series of rubber discs approximately the size of the conduit inner diameter on a length of steel cable with an eye on each end for attaching the pull ropes. Pull the rubber duct swab through the duct to extract loose debris from the duct.
- C. Pull Conductors: Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
  - 1. Where necessary, use manufacturer-approved pulling compound or lubricant that does not deteriorate conductor or insulation.
  - 2. Use pulling means, including fish tape, cable, rope, and basket-weave cable grips, that do not damage cables and raceways. Do not use rope hitches for pulling attachment to cable.
  - 3. Use pull-in guides, cable feeders, and draw-in protectors as required to protect cables during installation.
  - 4. Do not pull cables with ends unsealed. Seal cable ends with rubber tape.
- D. In manholes, handholes, pull boxes, junction boxes, and cable vaults, train cables around walls by the longest route from entry to exit; support cables at intervals adequate to prevent sag.
- E. Install sufficient cable length to remove cable ends under pulling grips. Remove length of conductor damaged during pulling.
- F. Install cable splices at pull points and elsewhere as indicated; use standard kits. Use dead-front separable watertight connectors in manholes and other locations subject to water infiltration.
- G. Install separable insulated-connector components as follows:
  - 1. Protective Cap: At each terminal junction, with one on each terminal to which no feeder is indicated to be connected.
  - 2. Portable Feed-Through Accessory: At each terminal junction, with one on each terminal.

3. Standoff Insulator: At each terminal junction, with one on each terminal.
- H. Arc Proofing: Arc proof medium-voltage cable at locations not protected by conduit, direct burial, or termination materials. In addition to arc-proofing tape manufacturer's written instructions, apply arc proofing as follows:
  1. Clean cable sheath.
  2. Wrap metallic cable components with 10-mil pipe-wrapping tape.
  3. Smooth surface contours with electrical insulation putty.
  4. Apply arc-proofing tape in one half-lapped layer with coated side toward cable.
  5. Band arc-proofing tape with two layers of 1-inch wide half-lapped, adhesive, glass-cloth tape at each end of the arc-proof tape.
- I. Ground shields of shielded cable at all terminations, splices, and separable insulated connectors. Ground metal bodies of terminators, splices, cable and separable insulated-connector fittings, and hardware.
- J. Identify cables according to Section 260553 "Identification for Electrical Systems." Identify phase and circuit number of each conductor at each splice, termination, pull point, and junction box. Arrange identification so that it is unnecessary to move the cable or conductor to read the identification.

### 3.2 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Perform the following tests and inspections:
  1. Perform each visual and mechanical inspection and electrical test stated in NETA ATS. Certify compliance with test parameters.
  2. After installing medium-voltage cables and before electrical circuitry has been energized, test for compliance with requirements.
  3. Perform direct-current High Potential test of each new conductor according to NETA ATS, Ch. 7.3.3. Do not exceed cable manufacturer's recommended maximum test voltage.
- C. Medium-voltage cables will be considered defective if they do not pass tests and inspections.
- D. Prepare test and inspection reports.

END OF SECTION 26 05 13

## SECTION 26 05 19 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Building wires and cables rated 600 V and less.
  - 2. Connectors, splices, and terminations rated 600 V and less.
- B. Related Requirements:
  - 1. Section 260513 "Medium-Voltage Cables" for single-conductor and multiconductor cables, cable splices, and terminations for electrical distribution systems with 2001 to 35,000 V.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Field quality-control reports.

#### 1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.
  - 1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

### PART 2 - PRODUCTS

#### 2.1 CONDUCTORS AND CABLES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Cerro Wire LLC.
  - 2. Encore Wire Corporation.

3. General Cable; General Cable Corporation.
  4. Southwire Company.
  5. Or approved equal.
- B. Copper Conductors: Comply with NEMA WC 70/ICEA S-95-658.
- C. Conductor Insulation: Comply with NEMA WC 70/ICEA S-95-658 for Type XHHW-2.
- D. Multiconductor Cable: Comply with NEMA WC 70/ICEA S-95-658 for metal-clad cable, Type MC with ground wire, with sunlight resistant PVC sheath.

## 2.2 CONNECTORS AND SPLICES

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
1. 3M.
  2. AFC Cable Systems.
  3. Hubbell Power Systems Inc.
  4. ILSCO.
  5. OZ Gedney.
  6. Polaris Electrical Connectors.
  7. TE Connectivity.
  8. Or approved equal.
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

## 2.3 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.

## PART 3 - EXECUTION

### 3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders and branch circuits: Copper. Solid or stranded for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

### 3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Exposed Feeders: Type XHHW-2, single conductors in raceway or Metal-clad cable, Type MC.

- B. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type XHHW-2, single conductors in raceway or Metal-clad cable, Type MC.
- C. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.

### 3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members and follow surface contours where possible.
- F. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

### 3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
  - 1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

### 3.5 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor and identify as spare conductor.



3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.7 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.

3.8 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
  - 1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
  - 2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
- B. Test and Inspection Reports: Prepare a written report to record the following:
  - 1. Procedures used.
  - 2. Results that comply with requirements.
  - 3. Results that do not comply with requirements and corrective action taken to achieve compliance with requirements.
- C. Cables will be considered defective if they do not pass tests and inspections.

END OF SECTION 26 05 19

## SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes grounding and bonding systems and equipment.
- B. Section includes grounding and bonding systems and equipment, plus the following special applications:
  - 1. Underground distribution grounding.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

#### 1.4 CLOSEOUT SUBMITTALS

- A. As-Built Data: Plans showing dimensioned as-built locations of grounding features specified in "Field Quality Control" Article, including the following:
  - 1. Ground rods.
  - 2. Ground rings.

#### 1.5 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Burndy; Part of Hubbell Electrical Systems.
  - 2. ERICO International Corporation.

3. Harger Lightning & Grounding.
4. ILSCO.
5. O-Z/Gedney; a brand of Emerson Industrial Automation.
6. Thomas & Betts Corporation; A Member of the ABB Group.
7. Or approved equal.

## 2.2 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

## 2.3 CONDUCTORS

- A. Insulated Conductors: Type XHHW-2 copper building wire insulated for 600 V.
- B. Bare Copper Conductors:
  1. Conductors: ASTM B 33.

## 2.4 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy.
- C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

## 2.5 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad; 3/4 inch by 10 feet.

## PART 3 - EXECUTION

### 3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
- B. Underground Grounding Conductors: Install bare copper conductor, sized as indicated. Bury at least 24 inches below grade.

- C. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.
- D. Conductor Terminations and Connections:
  - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
  - 2. Underground Connections: Welded connectors except as otherwise indicated.
  - 3. Connections to Ground Rods: Welded connectors.
  - 4. Connections to Structural Steel: Welded connectors.

### 3.2 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

- A. Comply with IEEE C2 grounding requirements.
- B. Grounding Manholes and Handholes: Install a driven ground rod through manhole or handhole floor, close to wall, and set rod depth so 4 inches will extend above finished floor. If necessary, install ground rod before manhole is placed and provide bare copper conductor, sized as indicated, from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from 2 inches above to 6 inches below concrete. Seal floor opening with waterproof, nonshrink grout.
- C. Grounding Connections to Manhole Components: Bond exposed-metal parts such as inserts, cable racks, pulling irons, ladders, and cable shields within each manhole or handhole, to ground rod or grounding conductor. Make connections with No. 4 AWG minimum, stranded, hard-drawn copper bonding conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields according to written instructions by manufacturer of splicing and termination kits.
- D. Pad-Mounted Transformers and Switches: Install two ground rods and ground ring around the pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes. Install -copper conductor not less than No. 2 AWG for ground ring and for taps to equipment grounding terminals. Bury ground ring not less than 6 inches from the foundation.

### 3.3 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.

### 3.4 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.

1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
- C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
  2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
  3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

### 3.5 FIELD QUALITY CONTROL

- A. Perform Tests and Inspections:
1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
  2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
  3. Test completed grounding system at each location where a maximum ground-resistance level is specified. Make tests at ground rods before any conductors are connected.
    - a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
    - b. Perform tests by fall-of-potential method according to IEEE 81.
  4. Prepare dimensioned Drawings locating each ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.
- B. Grounding system will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.
- D. Report measured ground resistances that exceed the following values:
1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
  2. Power and Lighting Equipment or System with Capacity of more than 500 kVA: 5 ohms.
  3. Substations and Pad-Mounted Equipment: 5 ohms.
  4. Manhole Grounds: 10 ohms.
- E. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Engineer promptly and include recommendations to reduce ground resistance.

END OF SECTION 26 05 26

## SECTION 26 05 29 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Hangers and supports for electrical equipment and systems.
- B. Related Requirements:
  - 1. Section 260548.16 "Seismic Controls for Electrical Systems" for products and installation requirements necessary for compliance with seismic criteria.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
    - a. Hangers.
    - b. Steel slotted support systems.
    - c. Clamps.
    - d. Turnbuckles.
    - e. Sockets.
    - f. Eye nuts.
    - g. Saddles.
    - h. Brackets.
  - 2. Include rated capacities and furnished specialties and accessories.

### PART 2 - PRODUCTS

#### 2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Comply with MFMA-4 factory-fabricated components for field assembly.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Allied Tube & Conduit.
    - b. Cooper B-Line, Inc.
    - c. ERICO International Corporation.

- d. GS Metals Corp.
  - e. Thomas & Betts Corporation.
  - f. Unistrut; Atkore International.
  - g. Or approved equal.
2. Material: Galvanized steel.
  3. Channel Width: 1-5/8 inches.
  4. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
  5. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
  6. Channel Dimensions: Selected for applicable load criteria.
- B. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- C. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M steel plates, shapes, and bars; black and galvanized.
- D. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
1. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
  2. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
  3. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
  4. Toggle Bolts: Stainless-steel springhead type.
  5. Hanger Rods: Threaded steel.

## PART 3 - EXECUTION

### 3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems unless requirements in this Section are stricter.
- B. Comply with requirements for raceways and boxes specified in Section 260533 "Raceways and Boxes for Electrical Systems."
- C. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

### 3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.

- B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
- C. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
  - 1. To Wood: Fasten with lag screws or through bolts.
  - 2. To New Concrete: Bolt to concrete inserts.
  - 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
  - 4. To Existing Concrete: Expansion anchor fasteners.
  - 5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
  - 6. To Steel: Beam clamps (MSS SP-58, Type 19, 21, 23, 25, or 27), complying with MSS SP-69.
  - 7. To Light Steel: Sheet metal screws.
  - 8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.
- D. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

### 3.3 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
  - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 26 05 29



## SECTION 26 05 33 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Metal conduits, tubing, and fittings.
  - 2. Nonmetal conduits, tubing, and fittings.
  - 3. Metal wireways and auxiliary gutters.
  - 4. Nonmetal wireways and auxiliary gutters.
  - 5. Boxes, enclosures, and cabinets.
- B. Related Requirements:
  - 1. Section 260543 "Underground Ducts and Raceways for Electrical Systems" for exterior ductbanks, manholes, and underground utility construction.

#### 1.3 DEFINITIONS

- A. GRC: Galvanized rigid steel conduit.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

### PART 2 - PRODUCTS

#### 2.1 METAL CONDUITS, TUBING, AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
  - 1. AFC Cable Systems, Inc.
  - 2. Allied Tube & Conduit.
  - 3. Anamet Electrical, Inc.
  - 4. Electri-Flex Company.

5. O-Z/Gedney.
  6. Picoma Industries.
  7. Republic Conduit.
  8. Robroy Industries.
  9. Southwire Company.
  10. Thomas & Betts Corporation.
  11. Western Tube and Conduit Corporation.
  12. Wheatland Tube Company.
  13. Or approved equal.
- B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. GRC: Comply with ANSI C80.1 and UL 6.
- D. EMT: Comply with ANSI C80.3 and UL 797.
- E. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.
- F. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
1. Fittings for EMT:
    - a. Material: Steel.
    - b. Type: Compression.
  2. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
  3. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.
- G. Joint Compound for GRC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

## 2.2 METAL WIREWAYS AND AUXILIARY GUTTERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
1. Cooper B-Line, Inc.
  2. Hoffman.
  3. Mono-Systems, Inc.
  4. Square D.
  5. Or approved equal.
- B. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 4X unless otherwise indicated, and sized according to NFPA 70.
1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

- C. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- D. Wireway Covers: Flanged-and-gasketed type unless otherwise indicated.
- E. Finish: Manufacturer's standard finish.

### 2.3 BOXES, ENCLOSURES, AND CABINETS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
  - 1. Cooper Technologies Company; Cooper Crouse-Hinds.
  - 2. EGS/Appleton Electric.
  - 3. Erickson Electrical Equipment Company.
  - 4. Hoffman.
  - 5. Hubbell Incorporated.
  - 6. Kraloy.
  - 7. Milbank Manufacturing Co.
  - 8. O-Z/Gedney.
  - 9. RACO; Hubbell.
  - 10. Stahlin Non-Metallic Enclosures.
  - 11. Thomas & Betts Corporation.
  - 12. Wiremold / Legrand.
  - 13. Or approved equal.
- B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.
- E. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- F. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, galvanized, cast iron with gasketed cover.
- G. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- H. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.
- I. Gangable boxes are prohibited.

## PART 3 - EXECUTION

### 3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
  - 1. Exposed Conduit: GRC.
  - 2. Concealed Conduit, Aboveground: GRC.
  - 3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
  - 4. Boxes and Enclosures, Aboveground: NEMA 250, Type 4X.
- B. Indoors: Apply raceway products as specified below unless otherwise indicated:
  - 1. Exposed: GRC.
  - 2. Concealed in Ceilings and Interior Walls and Partitions: EMT.
  - 3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
  - 4. Damp or Wet Locations: GRC.
  - 5. Boxes and Enclosures: NEMA 250, Type 12.
- C. Minimum Raceway Size: 3/4-inch trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
  - 1. Rigid Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
  - 2. EMT: Use compression, steel fittings. Comply with NEMA FB 2.10.
  - 3. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

### 3.2 INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter.
- B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Complete raceway installation before starting conductor installation.
- D. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.
- E. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- F. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.
- G. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

- H. Support conduit within 12 inches of enclosures to which attached.
- I. Raceways Embedded in Slabs:
  - 1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot intervals.
  - 2. Arrange raceways to keep a minimum of 2 inches of concrete cover in all directions.
  - 3. Do not embed threadless fittings in concrete.
- J. Stub-ups to Above Recessed Ceilings:
  - 1. Use EMT or RMC for raceways.
  - 2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
- K. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- L. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
- M. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
- N. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
- O. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- P. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
- Q. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
- R. Surface Raceways:
  - 1. Install surface raceway with a minimum 2-inch radius control at bend points.
  - 2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.

- S. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.
- T. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
  - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
  - 2. Where an underground service raceway enters a building or structure.
  - 3. Where otherwise required by NFPA 70.
- U. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 36 inches of LFMC for equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
- V. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- W. Locate boxes so that cover or plate will not span different building finishes.
- X. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
- Y. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

### 3.3 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

### 3.4 FIRESTOPPING

- A. Install firestopping at penetrations of fire-rated floor and wall assemblies.

### 3.5 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
  - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

END OF SECTION 26 05 33

## SECTION 26 05 43 - UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Metal conduits and fittings, including GRC.
  - 2. Rigid nonmetallic duct.
  - 3. Duct accessories.
  - 4. Precast manholes.
  - 5. Utility structure accessories.

#### 1.3 DEFINITIONS

- A. Direct Buried: Duct or a duct bank that is buried in the ground, without any additional casing materials such as concrete.
- B. Duct: A single duct or multiple ducts. Duct may be either installed singly or as component of a duct bank.
- C. Duct Bank:
  - 1. Two or more ducts installed in parallel, with or without additional casing materials.
  - 2. Multiple duct banks.
- D. GRC: Galvanized rigid (steel) conduit.
- E. Trafficways: Locations where vehicular or pedestrian traffic is a normal course of events.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include duct-bank materials, including spacers and miscellaneous components.
  - 2. Include duct, conduits, and their accessories, including elbows, end bells, bends, fittings, and solvent cement.
  - 3. Include accessories for manholes, boxes, and other utility structures.
  - 4. Include underground-line warning tape.

- B. Shop Drawings:
  - 1. Precast or Factory-Fabricated Underground Utility Structures:
    - a. Include plans, elevations, sections, details, attachments to other work, and accessories.
    - b. Include duct entry provisions, including locations and duct sizes.
    - c. Include reinforcement details.
    - d. Include frame and cover design.
    - e. Include ladder details.
    - f. Include grounding details.
    - g. Include dimensioned locations of cable rack inserts, pulling-in and lifting irons, and sumps.
    - h. Include joint details.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For concrete and steel used in precast concrete manholes, as required by ASTM C 858.
- B. Source quality-control reports.
- C. Field quality-control reports.

#### 1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

#### 1.7 FIELD CONDITIONS

- A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions, and then only after arranging to provide temporary electrical service according to the requirements specified in Division 01:
  - 1. Notify Owner no fewer than five days in advance of proposed interruption of electrical service.
  - 2. Do not proceed with interruption of electrical service without Owner's written permission.
- B. Ground Water: Assume ground-water level is at grade level unless a lower water table is noted on Drawings.

### PART 2 - PRODUCTS

#### 2.1 METAL CONDUIT AND FITTINGS

- A. GRC: Comply with ANSI C80.1 and UL 6.



- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Allied Tube & Conduit; a part of Atkore International.
  - 2. Republic Conduit.
  - 3. Western Tube and Conduit Corporation.
  - 4. Wheatland Tube Company.
  - 5. Or approved equal.
- C. Listed and labeled as defined in NFPA 70, by a nationally recognized testing laboratory, and marked for intended location and application.

## 2.2 RIGID NONMETALLIC DUCT

- A. Underground Plastic Utilities Duct: Schedule 80-PVC RNC, complying with NEMA TC 2 and UL 651, with matching fittings complying with NEMA TC 3 by same manufacturer as duct.
- B. Manufacturers: Subject to compliance with requirements, provide products by the following:
  - 1. Allied Tube & Conduit; a part of Atkore International.
  - 2. CANTEX INC.
  - 3. JM Eagle
  - 4. Prime Conduit
  - 5. Or approved equal.
- C. Listed and labeled as defined in NFPA 70, by a nationally recognized testing laboratory, and marked for intended location and application.

## 2.3 FLEXIBLE NONMETALLIC DUCTS

- A. HDPE Duct: UV stabilized, suitable for direct burial, complying with NEMA TC 7, NEC Article 353, and UL 651A.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
    - a. ARNCO Corp.
    - b. Carlon; a brand of Thomas & Betts Corporation.
    - c. National Pipe & Plastics.
    - d. Opti-Com Manufacturing Network, Inc (OMNI).
    - e. Premier Conduit.
    - f. Or approved equal.
  - 2. Listed and labeled as defined in NFPA 70, by a nationally recognized testing laboratory, and marked for intended location and application.

## 2.4 DUCT ACCESSORIES

- A. Duct Spacers: Factory-fabricated, rigid, PVC interlocking spacers; sized for type and size of duct with which used, and selected to provide minimum duct spacing indicated while supporting duct during concreting or backfilling.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Allied Tube & Conduit; a part of Atkore International.
  - b. CANTEX INC.
  - c. Carlon; a brand of Thomas & Betts Corporation.
  - d. IPEX USA LLC.
  - e. PenCell Plastics.
  - f. Underground Devices, Inc.
  - g. Or approved equal.
- B. Underground-Line Warning Tape: Comply with requirements for underground-line warning tape specified in Section 260553 "Identification for Electrical Systems."

## 2.5 PRECAST MANHOLES

- A. Description: One-piece units and units with interlocking mating sections, complete with accessories, hardware, and features.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. Anchorage Sand and Gravel
  2. Columbia Precast Products
  3. Fairbanks Materials Inc.
  4. Granite Precast
  5. Precast Concrete Co Inc.
  6. Oldcastle Precast, Inc.
  7. Shope Concrete Products
  8. Or approved equal.
- C. Comply with ASTM C 858.
- D. Structural Design Loading: Comply with requirements in "Underground Enclosure Application" Article.
- E. Knockout Panels: Precast openings in walls, arranged to match dimensions and elevations of approaching duct, plus an additional 12 inches vertically and horizontally to accommodate alignment variations.
  1. Splayed location.
  2. Knockout panels shall be located no less than 6 inches from interior surfaces of walls, floors, or roofs of manholes, but close enough to corners to facilitate racking of cables on walls.
  3. Knockout panel opening shall have cast-in-place, welded-wire fabric reinforcement for field cutting and bending to tie in to concrete envelopes of duct.
  4. Knockout panel shall be framed with at least two additional No. 3 steel reinforcing bars in concrete around each opening.
  5. Knockout panels shall be 1-1/2 to 2 inches thick.
- F. Duct Entrances in Manhole Walls: Cast end-bell or duct-terminating fitting in wall for each entering duct.
  1. Type and size shall match fittings to duct to be terminated.

2. Fittings shall align with elevations of approaching duct and be located near interior corners of manholes to facilitate racking of cable.
- G. Ground Rod Sleeve: Provide a 3-inch PVC sleeve in manhole floors 2 inches from the wall adjacent to, but not underneath, the duct entering the structure.
- H. Joint Sealant: Asphaltic-butyl material with adhesion, cohesion, flexibility, and durability properties necessary to withstand maximum hydrostatic pressures at the installation location with the ground-water level at grade.

## 2.6 UTILITY STRUCTURE ACCESSORIES

- A. Accessories for Utility Structures: Utility equipment and accessory items used for utility structure access and utility support, listed and labeled for intended use and application.
- B. Manhole Frames and Covers: Comply with structural design loading specified for manhole.
  1. Frame and Cover: Weatherproof, gray cast iron complying with ASTM A 48/A 48M, Class 30B with milled cover-to-frame bearing surfaces; diameter, 29 inches (725 mm).
    - a. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
  2. Cover Legend: Cast in. Selected to suit system.
    - a. Legend: "ELECTRIC".
- C. Manhole Sump Frame and Grate: ASTM A 48/A 48M, Class 30B, gray cast iron.
- D. Pulling Eyes in Concrete Walls: Eyebolt with reinforcing-bar fastening insert, 2-inch- diameter eye, and 1-by-4-inch bolt.
  1. Working Load Embedded in 6-Inch, 4000-psi Concrete: 13,000-lbf minimum tension.
- E. Pulling-in and Lifting Irons in Concrete Floors: 7/8-inch- diameter, hot-dip galvanized, bent steel rod; stress relieved after forming; and fastened to reinforcing rod. Exposed triangular opening.
  1. Ultimate Yield Strength: 40,000-lbf shear and 60,000-lbf tension.
- F. Bolting Inserts for Concrete Utility Structure Cable Racks and Other Attachments: Flared, threaded inserts of noncorrosive, chemical-resistant, nonconductive thermoplastic material; 1/2-inch ID by 2-3/4 inches deep, flared to 1-1/4 inches minimum at base.
  1. Tested Ultimate Pullout Strength: 12,000 lbf minimum.
- G. Ground Rod Sleeve: 3-inch PVC sleeve in manhole floors 2 inches from the wall adjacent to, but not underneath, the ducts routed from the facility.
- H. Expansion Anchors for Installation after Concrete Is Cast: Zinc-plated, carbon-steel-wedge type with stainless-steel expander clip with 1/2-inch bolt, 5300-lbf rated pullout strength, and minimum 6800-lbf rated shear strength.
- I. Cable Rack Assembly: Steel, hot-dip galvanized, except insulators.
  1. Stanchions: T-section or channel; 2-1/4-inch nominal size; punched with 14 holes on 1-1/2-inch centers for cable-arm attachment.

2. Arms: 1-1/2 inches wide, lengths ranging from 3 inches with 450-lb minimum capacity to 18 inches with 250-lb minimum capacity. Arms shall have slots along full length for cable ties and be arranged for secure mounting in horizontal position at any vertical location on stanchions.
  3. Insulators: High-glaze, wet-process porcelain arranged for mounting on cable arms.
- J. Cable Rack Assembly: Nonmetallic. Components fabricated from nonconductive, fiber-glass-reinforced polymer.
1. Stanchions: Nominal 36 inches high by 4 inches wide, with minimum of nine holes for arm attachment.
  2. Arms: Arranged for secure, drop-in attachment in horizontal position at any location on cable stanchions, and capable of being locked in position. Arms shall be available in lengths ranging from 3 inches with 450-lb minimum capacity to 20 inches with 250-lb minimum capacity. Top of arm shall be nominally 4 inches wide, and arm shall have slots along full length for cable ties.
- K. Duct-Sealing Compound: Nonhardening, safe for contact with human skin, not deleterious to cable insulation, and workable at temperatures as low as 35 deg F. Capable of withstanding temperature of 300 deg F without slump and adhering to clean surfaces of plastic ducts, metallic conduit, conduit and duct coatings, concrete, masonry, lead, cable sheaths, cable jackets, insulation materials, and common metals.
- L. Fixed Manhole Ladders: Arranged for attachment to roof or wall and floor of manhole. Ladder and mounting brackets and braces shall be fabricated from hot-dip galvanized steel.
- M. Cover Hooks: Heavy duty, designed for lifts 60 lbf and greater. Two required.

## 2.7 SOURCE QUALITY CONTROL

- A. Test and inspect precast concrete utility structures according to ASTM C 1037.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Coordinate layout and installation of duct, duct bank, manholes and boxes with final arrangement of other utilities, site grading, and surface features as determined in the field. Notify Architect if there is a conflict between areas of excavation and existing structures or archaeological sites to remain.
- B. Coordinate elevations of duct and duct-bank entrances into manholes and boxes with final locations and profiles of duct and duct banks, as determined by coordination with other utilities, underground obstructions, and surface features. Revise locations and elevations as required to suit field conditions and to ensure that duct and duct bank will drain to manholes, and as approved by Engineer.

### 3.2 UNDERGROUND DUCT APPLICATION

- A. Duct for Electrical Feeders: Rigid Non-Metallic Duct or Flexible Non-Metallic Duct, direct-buried unless otherwise indicated.

### 3.3 UNDERGROUND ENCLOSURE APPLICATION

- A. Manholes: Precast concrete.
  - 1. H-20 structural load rating according to AASHTO HB 17.

### 3.4 EARTHWORK

- A. Restoration: Replace area immediately after backfilling is completed.
- B. Restore surface features at areas disturbed by excavation and re-establish original grades unless otherwise indicated. Replace removed sod immediately after backfilling is completed.
- C. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work.
- D. Cut and patch existing pavement in the path of underground duct, duct bank, and underground structures to match existing conditions.

### 3.5 DUCT AND DUCT-BANK INSTALLATION

- A. Install duct according to NEMA TCB 2.
- B. Slope: Pitch duct a minimum slope of 1:300 down toward manholes and away from buildings and equipment. Slope duct from a high point between two manholes, to drain in both directions.
- C. Curves and Bends: Use 5-degree angle couplings for small changes in direction. Use manufactured long sweep bends with a minimum radius of 48 inches, both horizontally and vertically, at other locations unless otherwise indicated.
  - 1. Duct shall have maximum of three 90-degree bends or the total of all bends shall be no more 270 degrees between pull points.
- D. Joints: Use solvent-cemented joints in duct and fittings and make watertight according to manufacturer's written instructions. Stagger couplings so those of adjacent duct do not lie in same plane.
- E. End Bell Entrances to Manholes: Use end bells, spaced approximately 8 inches o.c. for 4-inch duct, and vary proportionately for other duct sizes.
  - 1. Begin change from regular spacing to end-bell spacing 10 feet from the end bell, without reducing duct slope and without forming a trap in the line.

2. Expansion and Deflection Fittings: Install an expansion and deflection fitting in each duct in the area of disturbed earth adjacent to manhole. Install an expansion fitting near the center of all straight line direct-buried duct with calculated expansion of more than 3/4 inch.
  3. Grout end bells into structure walls from both sides to provide watertight entrances.
- F. Terminator Entrances to Manholes: Use manufactured, cast-in-place duct terminators, with entrances into structure spaced approximately 6 inches o.c. for 4-inch duct and vary proportionately for other duct sizes.
1. Begin change from regular spacing to terminator spacing 10 feet from the terminator, without reducing duct line slope and without forming a trap in the line.
  2. Expansion and Deflection Fittings: Install an expansion and deflection fitting in each duct in the area of disturbed earth adjacent to manhole. Install an expansion fitting near the center of all straight line duct with calculated expansion of more than 3/4 inch.
- G. Building Wall Penetrations: Make a transition from underground duct to GRC at least 10 feet outside the building wall, without reducing duct line slope away from the building and without forming a trap in the line. Use fittings manufactured for RNC-to-GRC transition. Install GRC penetrations of building walls as specified in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."
- H. Sealing: Provide temporary closure at terminations of duct with pulled cables. Seal spare duct at terminations. Use sealing compound and plugs to withstand at least 15-psig hydrostatic pressure.
- I. Pulling Cord: Install 200-lbf- test nylon cord in empty ducts.
- J. Direct-Buried Duct and Duct Bank:
1. Excavate trench bottom to provide firm and uniform support for duct. Remove debris and sharp stones from trench bottoms and compact to 85%.
  2. Width: Excavate trench 12 inches wider than duct on each side.
  3. Width: Excavate trench 3 inches wider than duct on each side.
  4. Depth: Install top of duct at least 30 inches below finished grade unless otherwise indicated.
  5. Set elevation of bottom of duct bank below frost line.
  6. Support ducts on duct spacers coordinated with duct size, duct spacing, and outdoor temperature.
  7. Spacer Installation: Place spacers close enough to prevent sagging and deforming of duct, with not less than five spacers per 20 feet of duct. Place spacers within 24 inches of duct ends. Stagger spacers approximately 6 inches between tiers. Tie entire assembly together using fabric straps; do not use tie wires or reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.
  8. Install duct with a minimum of 3 inches between ducts for like services and 6 inches between power and communications duct.
  9. Elbows: Install manufactured duct elbows for stub-ups, at building entrances, and at changes of direction in duct direction unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
  10. After installing first tier of duct, backfill and compact. Start at tie-in point and work toward end of duct run, leaving ducts at end of run free to move with expansion and contraction as temperature changes during this process. Repeat procedure after placing each tier. After placing last tier, hand place backfill to 4 inches over duct and hand tamp.

Firmly tamp backfill around ducts to provide maximum supporting strength. Use hand tamper only. After placing controlled backfill over final tier, make final duct connections at end of run and complete backfilling with normal compaction.

- a. Place minimum 3 inches of sand as a bed for duct. Place sand to a minimum of 6 inches above top level of duct.
- K. Underground-Line Warning Tape: Bury conducting underground line specified in Section 260553 "Identification for Electrical Systems" no less than 12 inches above all concrete-encased duct and duct banks and approximately 12 inches below grade. Align tape parallel to and within 3 inches of centerline of duct bank.

### 3.6 INSTALLATION OF CONCRETE MANHOLES AND BOXES

- A. Elevations:
1. Manhole Frame: In paved areas and trafficways, set frames flush with finished grade. Set other manhole frames 1 inch above finished grade.
- B. Drainage: Install drains in bottom of manholes.
- C. Waterproofing: Apply Elastomeric Sheet waterproofing to exterior surfaces of manholes after concrete has cured at least three days. After duct has been connected and grouted, and before backfilling, waterproof joints and connections, and touch up abrasions and scars.
- D. Hardware: Install removable hardware, including pulling eyes, cable stanchions, as required for installation and support of cables and conductors and as indicated.
- E. Fixed Manhole Ladders: Arrange to provide for safe entry with maximum clearance from cables and other items in manholes.
- F. Field-Installed Bolting Anchors in Manholes: Do not drill deeper than 3-7/8 inches for manholes for anchor bolts installed in the field. Use a minimum of two anchors for each cable stanchion.

### 3.7 GROUNDING

- A. Ground underground ducts and utility structures according to Section 260526 "Grounding and Bonding for Electrical Systems."

### 3.8 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
1. Demonstrate capability and compliance with requirements on completion of installation of underground duct, duct bank, and utility structures.
  2. Pull solid aluminum or wood test mandrel through duct to prove joint integrity and adequate bend radii, and test for out-of-round duct. Provide a minimum 12-inch- long mandrel equal to duct size minus 1/4 inch. If obstructions are indicated, remove obstructions and retest.

3. Test manhole grounding to ensure electrical continuity of grounding and bonding connections. Measure and report ground resistance as specified in Section 260526 "Grounding and Bonding for Electrical Systems."
- B. Correct deficiencies and retest as specified above to demonstrate compliance.
- C. Prepare test and inspection reports.

### 3.9 CLEANING

- A. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of duct until duct cleaner indicates that duct is clear of dirt and debris. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.
- B. Clean internal surfaces of manholes, including sump.
  1. Sweep floor, removing dirt and debris.
  2. Remove foreign material.

END OF SECTION 26 05 43



## SECTION 26 05 44 - SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
  - 2. Sleeve-seal systems.
  - 3. Sleeve-seal fittings.
  - 4. Grout.
  - 5. Silicone sealants.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

### PART 2 - PRODUCTS

#### 2.1 SLEEVES

- A. Wall Sleeves:
  - 1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
  - 2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
- B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.
- C. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.
- D. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.
- E. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.

- F. Sleeves for Rectangular Openings:
  - 1. Material: Galvanized sheet steel.
  - 2. Minimum Metal Thickness:
    - a. For sleeve cross-section rectangle perimeter less than 50 inches and with no side larger than 16 inches , thickness shall be 0.052 inch.
    - b. For sleeve cross-section rectangle perimeter 50 inches or more and one or more sides larger than 16 inches, thickness shall be 0.138 inch.

## 2.2 GROUT

- A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.
- B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

## 2.3 SILICONE SEALANTS

- A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.
  - 1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.
- B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

## PART 3 - EXECUTION

### 3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

- A. Comply with NECA 1.
- B. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:
  - 1. Interior Penetrations of Non-Fire-Rated Walls and Floors:
    - a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint.
    - b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.
  - 2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
  - 3. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed.

4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
  5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches above finished floor level. Install sleeves during erection of floors.
- C. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:
1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
  2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.
- D. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel or cast-iron pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

### 3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.
- B. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

### 3.3 SLEEVE-SEAL-FITTING INSTALLATION

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION 26 05 44

## SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  1. Identification for raceways.
  2. Identification of power and control cables.
  3. Identification for conductors.
  4. Underground-line warning tape.
  5. Warning labels and signs.
  6. Instruction signs.
  7. Equipment identification labels, including arc-flash warning labels.
  8. Miscellaneous identification products.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for electrical identification products.
- B. Samples: For each type of label and sign to illustrate composition, size, colors, lettering style, mounting provisions, and graphic features of identification products.
- C. Identification Schedule: For each piece of electrical equipment and electrical system components to be an index of nomenclature for electrical equipment and system components used in identification signs and labels. Use same designations indicated on Drawings.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Comply with ASME A13.1 and IEEE C2.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.

- E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.
- F. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
  - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

## 2.2 COLOR AND LEGEND REQUIREMENTS

- A. Raceways and Cables Carrying Circuits at 600 V or Less:
  - 1. Black letters on an orange field.
  - 2. Legend: Indicate voltage.
- B. Raceways and Cables Carrying Circuits at More Than 600 V:
  - 1. Black letters on an orange field.
  - 2. Legend: "DANGER - CONCEALED HIGH VOLTAGE WIRING."
- C. Warning labels and signs shall include, but are not limited to, the following legends:
  - 1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
  - 2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."

## 2.3 LABELS

- A. Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible labels laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing label ends.
  - 1. Brady Corp.
  - 2. Panduit Corp.
  - 3. Or approved equal.
- B. Snap-Around Labels for Raceways and Cables Carrying Circuits at 600 V or Less: Slit, pre-tensioned, flexible, preprinted, color-coded acrylic sleeves, with diameters sized to suit diameters of raceways they identify, and that stay in place by gripping action.
  - 1. Brady Corp.
  - 2. Panduit Corp.
  - 3. Or approved equal.
- C. Self-Adhesive Labels: Vinyl, thermal, transfer-printed, 3-mil- thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated. Nominal Size: 3.5-by-5-inch.
  - 1. Brady Corp.
  - 2. Panduit Corp.
  - 3. Or approved equal.

## 2.4 BANDS AND TUBES:

- A. Snap-Around, Color-Coding Bands for Raceways and Cables: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2 inches long, with diameters sized to suit diameters of raceways or cables they identify, and that stay in place by gripping action.
  - 1. Brady Corp.
  - 2. Panduit Corp.
  - 3. Or approved equal.
- B. Heat-Shrink Preprinted Tubes: Flame-retardant polyolefin tubes with machine-printed identification labels, sized to suit diameters of and shrunk to fit firmly around cables they identify. Full shrink recovery occurs at a maximum of 200 deg F. Comply with UL 224.
  - 1. Brady Corp.
  - 2. Panduit Corp.
  - 3. Or approved equal.

## 2.5 TAPES AND STENCILS:

- A. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.
  - 1. 3M.
  - 2. Brady Corp.
  - 3. Panduit Corp.
  - 4. Or approved equal.
- B. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils thick by 1 to 2 inches wide; compounded for outdoor use.
  - 1. 3M.
  - 2. Brady Corp.
  - 3. Panduit Corp.
  - 4. Or approved equal.
- C. Underground-Line Warning Tape
  - 1. Tape:
    - a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical utility lines.
    - b. Printing on tape shall be permanent and shall not be damaged by burial operations.
    - c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.
  - 2. Color and Printing:
    - a. Comply with ANSI Z535.1, ANSI Z535.2, ANSI Z535.3, ANSI Z535.4, and ANSI Z535.5.
    - b. Inscriptions for Red-Colored Tapes: "ELECTRIC LINE, HIGH VOLTAGE".
  - 3. Requirements:
    - a. Detectable three-layer laminate, consisting of a printed pigmented polyolefin film, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core; bright colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
    - b. Width: 3 inches .

- c. Overall Thickness: 5 mils.
  - d. Foil Core Thickness: 0.35 mil
  - e. Weight: 28 lb/1000 sq. ft.
  - f. Tensile according to ASTM D 882: 70 lbf and 4600 psi.
- D. Nonmetallic Preprinted Tags: Polyethylene tags, 0.023 inch thick, color-coded for phase and voltage level, with factory [screened] [printed] permanent designations; punched for use with self-locking cable tie fastener.
1. Brady Corp.
  2. Panduit Corp.
  3. Or approved equal.

## 2.6 SIGNS

- A. Baked-Enamel Signs:
1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
  2. 1/4-inch grommets in corners for mounting.
  3. Nominal Size: 7 by 10 inches.
- B. Laminated Acrylic or Melamine Plastic Signs:
1. Engraved legend.
  2. Thickness:
    - a. For signs up to 20 sq. inches, minimum 1/16-inch.
    - b. For signs larger than 20 sq. inches, 1/8 inch thick.
    - c. Engraved legend with black letters on white face.
    - d. Punched or drilled for mechanical fasteners.
    - e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

## 2.7 CABLE TIES

- A. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, Type 6/6 nylon.
1. Minimum Width: 3/16 inch.
  2. Tensile Strength at 73 deg F according to ASTM D 638: 12,000 psi.
  3. Temperature Range: Minus 40 to plus 185 deg F.
  4. Color: Black.

## 2.8 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

### 3.2 INSTALLATION

- A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.
- B. Install identifying devices before installing acoustical ceilings and similar concealment.
- C. Verify identity of each item before installing identification products.
- D. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.
- E. Apply identification devices to surfaces that require finish after completing finish work.
- F. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- G. Attach plastic raceway and cable labels that are not self-adhesive type with clear vinyl tape, with adhesive appropriate to the location and substrate.
- H. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:
  - 1. Outdoors: UV-stabilized nylon.
  - 2. In Spaces Handling Environmental Air: Plenum rated.
- I. Painted Identification: Comply with requirements in painting Sections for surface preparation and paint application.
- J. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.
- K. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.



- L. During backfilling of trenches, install continuous underground-line warning tape directly above cable or raceway at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench exceeds 16 inches overall.

### 3.3 IDENTIFICATION SCHEDULE

- A. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits: Identify with self-adhesive vinyl label. Install labels at 30-foot maximum intervals.
- B. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.
  - 1. Color-Coding for Phase and Voltage-Level Identification, 600 V or Less: Use colors listed below for ungrounded service, feeder, and branch-circuit conductors.
    - a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG.
    - b. Colors for 208/120-V Circuits:
      - 1) Phase A: Black.
      - 2) Phase B: Red.
      - 3) Phase C: Blue.
    - c. Colors for 480/277-V Circuits:
      - 1) Phase A: Brown.
      - 2) Phase B: Orange.
      - 3) Phase C: Yellow.
    - d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
- C. Power-Circuit Conductor Identification, More Than 600 V: For conductors in vaults, pull and junction boxes, manholes, and handholes, use nonmetallic preprinted tags colored and marked to indicate phase, and a separate tag with the circuit designation.
- D. Install instructional sign, including the color code for grounded and ungrounded conductors using adhesive-film-type labels.
- E. Conductors To Be Extended in the Future: Attach marker tape to conductors and list source.
- F. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical-fiber cable.
  - 1. Limit use of underground-line warning tape to direct-buried cables.
  - 2. Install underground-line warning tape for direct-buried cables and cables in raceways.
- G. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall comply with NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.
- H. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels.

1. Comply with 29 CFR 1910.145.
  2. Identify system voltage with black letters on an orange background.
  3. Apply to exterior of door, cover, or other access.
  4. For equipment with multiple power or control sources, apply to door or cover of equipment
- I. Arc Flash Warning Labeling: Self-adhesive thermal transfer vinyl labels.
1. Comply with NFPA 70E and ANSI Z535.4.
- J. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
- K. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch- high letters for emergency instructions at equipment used for power transfer or load shedding.
- L. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm unless equipment is provided with its own identification.
1. Labeling Instructions:
    - a. Indoor Equipment: Self-adhesive, engraved, laminated acrylic or melamine plastic label. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on 1-1/2-inch- high label; where two lines of text are required, use labels 2 inches high.
    - b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
    - c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
    - d. Unless labels are provided with self-adhesive means of attachment, fasten them with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.
  2. Equipment To Be Labeled:
    - a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be in the form of a self-adhesive, engraved, laminated acrylic or melamine label.
    - b. Enclosures and electrical cabinets.
    - c. Access doors and panels for concealed electrical items.
    - d. Switchgear.
    - e. Switchboards.
    - f. Transformers: Label that includes tag designation shown on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
    - g. Enclosed switches.
    - h. Enclosed circuit breakers.

END OF SECTION 26 05 53

## SECTION 26 12 19 - PAD-MOUNTED, LIQUID-FILLED, MEDIUM-VOLTAGE TRANSFORMERS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes pad-mounted, liquid-filled, medium-voltage distribution transformers, with primary and secondary bushings within or without air-terminal enclosures.

#### 1.3 DEFINITIONS

- A. BIL: Basic Impulse Insulation Level.
- B. Bushing: An insulating structure including a central conductor, or providing a central passage for a conductor, with provision for mounting on a barrier, conducting or otherwise, for the purpose of insulating the conductor from the barrier and conducting current from one side of the barrier to the other.
- C. Bushing Elbow: An insulated device used to connect insulated conductors to separable insulated connectors on dead-front, pad-mounted transformers and to provide a fully insulated connection. This is also called an "elbow connector."
- D. Bushing Insert: That component of a separable insulated connector that is inserted into a bushing well to complete a dead-front, load break or nonload break, separable insulated connector (bushing).
- E. Bushing Well: A component of a separable insulated connector, either permanently welded or clamped to an enclosure wall or barrier, having a cavity that receives a replaceable component (bushing insert) to complete the separable insulated connector (bushing).
- F. Elbow Connector: See "bushing elbow" above.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include rated capacities, operating characteristics, and furnished specialties and accessories.

- B. Shop Drawings: For pad-mounted, liquid-filled, medium-voltage transformers.
  - 1. Include plans and elevations showing major components and features.
    - a. Include a plan view and cross section of equipment base, showing clearances, required workspace, and locations of penetrations for grounding and conduits.
  - 2. Include details of equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  - 3. Include single-line diagram.
  - 4. Include list of materials.
  - 5. Include nameplate data.
  - 6. Manufacturer's published time-current curves of the transformer high-voltage fuses, with transformer damage curve, inrush curve, and thru fault current indicated.

### 1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings:
  - 1. Utilities site plan, drawn to scale, showing heavy equipment or truck access paths for maintenance and replacement.
- B. Qualification Data: For testing agency.
- C. Seismic Qualification Certificates: For transformer assembly, accessories, and components, from manufacturer.
  - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
  - 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity, and locate and describe mounting and anchorage provisions.
  - 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- D. Product Certificates: For transformers, signed by product manufacturer.
- E. Source quality-control reports.
- F. Field quality-control reports.

### 1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For transformer and accessories to include in emergency, operation, and maintenance manuals.

### 1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.
  - 1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

## PART 2 - PRODUCTS

### 2.1 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: FM listed and labeled and marked for intended location and application.
- B. Comply with IEEE C2.
- C. Comply with IEEE C57.12.00.

### 2.2 PERFORMANCE REQUIREMENTS

- A. Windings Material: Copper.
- B. Surge Arresters: Comply with IEEE C62.11, Distribution Class; metal-oxide-varistor type, fully shielded, separable-elbow type, suitable for plugging into the inserts provided in the high-voltage section of the transformer. Connected in each phase of incoming circuit and ahead of any disconnecting device.
- C. Winding Connections: The connection of windings and terminal markings shall comply with IEEE C57.12.70.
- D. Efficiency: Comply with 10 CFR 431, Subpart K.
- E. Insulation: Transformer kVA rating shall be as follows: The average winding temperature rise above a 30 deg C ambient temperature shall not exceed 65 deg C and 80 deg C hottest-spot temperature rise at rated kVA when tested according to IEEE C57.12.90, using combination of connections and taps that give the highest average winding temperature rise.
- F. Tap Changer: External handle, for de-energized operation.
- G. Tank: Sealed, with welded-on cover. Designed to withstand internal pressure of not less than 7 psi without permanent distortion and 15 psig without rupture. Comply with IEEE C57.12.36.
- H. Enclosure Integrity: Comply with IEEE C57.12.29.
- I. Mounting: An integral skid mounting frame, suitable to allow skidding or rolling of transformer in any direction, and with provision for anchoring frame to pad.
- J. Insulating Liquids:
  - 1. FM Listed Less-Flammable Liquids:
    - a. Biodegradable and Nontoxic Dielectric: Listed and labeled by an NRTL as complying with NFPA 70 requirements for fire point of not less than 300 deg C when tested according to ASTM D 92.
- K. Sound level shall comply with NEMA TR 1 requirements.
- L. Corrosion Protection:

1. Transformer coating system shall be factory applied, complying with requirements of IEEE C57.12.29, in manufacturer's standard color.
2. Fabricate front sill, hood, and tank base of single-compartment transformers from stainless steel according to ASTM A 167, Type 304 or 304L, not less than No. 13 U.S. gage, complying with requirements of IEEE C57.12.29, standard color.
3. Base and Cabinets of Two Compartment Transformers: Fabricate from stainless steel according to ASTM A 167, Type 304 or 304L, not less than No. 13 U.S. gage. Coat transformer with manufacturer's standard green color coating complying with requirements of IEEE C57.12.29, in manufacturer's standard color.

## 2.3 THREE-PHASE TRANSFORMERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. ABB.
  2. Cooper Power Systems.
  3. ERMCO.
  4. GE.
  5. Or approved equal.
- B. Description:
  1. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
  2. Comply with IEEE C57.12.26.
- C. Compartment Construction:
  1. Double-Compartment Construction: Individual compartments for high- and low-voltage sections, formed by steel isolating barriers that extend full height and depth of compartments, with hinged, lift-off doors and three-point latching, with a stop in the open position and provision for padlocking.
- D. Primary Fusing: Designed and rated to provide thermal protection of transformer by sensing overcurrent and high liquid temperature per manufacturer's instructions.
  1. 150-kV BIL current-limiting fuses, conforming to requirements of IEEE C37.47.
  2. Interrupting Rating: 50,000 rms A symmetrical at system voltage.
  3. Fuse Assembly: Bayonet-type, liquid-immersed, expulsion fuses in series with liquid-immersed, partial-range, current-limiting fuses. Bayonet fuse shall sense both high currents and high oil temperature to provide thermal protection to the transformer.
  4. Provide bayonet fuse assembly with an oil retention valve and an external drip shield inside the housing to eliminate or minimize oil spills. Valve shall close when fuse holder is removed and an external drip shield is installed.
  5. Provide a conspicuously displayed warning adjacent to bayonet fuse(s), cautioning against removing or inserting fuses unless transformer has been de-energized and tank pressure has been released.
- E. High-Voltage Section: Dead-front design.
  1. To connect primary cable, use separable insulated connectors; coordinated with and complying with requirements of Section 260513 "Medium-Voltage Cables." Bushings shall be one-piece units, with ampere and BIL ratings the same as connectors.

2. Bushing inserts and feed-through inserts:
  - a. Conform to the requirements of IEEE 386.
  - b. Rated at 200 A, with voltage class matching connectors. Provide a parking stand near each bushing well. Parking stands shall be equipped with insulated standoff bushings for parking of energized load-break elbow connectors on parking stands.
  - c. Provide insulated protective caps for insulating and sealing out moisture from unused bushing inserts and insulated standoff bushings.
3. Bushing wells configured for loop-feed application.
4. Access to liquid-immersed fuses.
5. Dead-front surge arresters.
6. Tap-changer operator.
7. Load-Break Switch:
  - a. Loop-feed sectionalizing switches, using three two-position, liquid-immersed-type switches for closed transition loop-feed and sectionalizing operation. Voltage class and BIL shall match that of separable connectors, with a continuous current rating and load-break rating of 300 amperes, and a make-and-latch rating of 12 kA rms symmetrical. Switch operation shall be as follows:
    - 1) Position I: Line A connected to line B and both lines connected to the transformer.
    - 2) Position II: Transformer connected to line A only.
    - 3) Position III: Transformer connected to line B only.
    - 4) Position IV: Transformer disconnected and line A not connected to line B.
    - 5) Position V: Transformer disconnected and line A connected to line B.
8. Ground pad.
9. Vacuum fault interrupter for transformer protection in lieu of primary fusing, where indicated: Cooper Power Systems VFI or approved equal.
  - a. 600A continuous current
  - b. 12.5 kA interrupting.
  - c. 600A load switching.
  - d. The VFI shall act as a three-phase group operated circuit breaker.
  - e. A single operating handle shall be provided for manual opening, reset and closing.
  - f. Overcurrent sensing shall be accomplished with an electronic trip control that shall be Cooper Power Systems type Tri-Phase Control with Ground (TPG) control or approved equal.
  - g. The control shall use internally mounted 1000:1 bushing current transformers (CTs) to sense line current and shall also provide the control operating power, eliminating the effects of system voltage conditions. The control shall be self-contained and includes the following:
    - h. Meet the specified time-current curve immediately upon energization.
    - i. No “warm-up”, initialization, or arming time delays adjustments shall be necessary.
    - j. No minimum load requirement or battery back-up device shall be necessary to meet the specified time-current characteristics.
    - k. The control shall have a minimum operating temperature range of -30 °C to +65 °C with no more than a ±5% variation in time-current response characteristics from its response at +25 °C.
    - l. The standard control shall provide minimum phase overcurrent trip settings that are field selectable (in 10-amp increments) from 20 amps to 1290 amps. Trip settings may be changed while the transformer is energized (so service is not interrupted). An instantaneous trip feature shall be provided as a standard feature of the control. Instantaneous trip shall be a field selectable multiple of 1X, 3X, 5X,

15X times the phase overcurrent trip settings or it may be selected to be disabled. The instantaneous trip feature shall provide a fixed 0.025-second response time characteristic.

- m. A single time-current curve shall be provided that is common to all three phases. Time-current trip curves shall be changeable.
- n. The control and its enclosure shall be mounted on the inside of the cabinet door of the VFI tap compartment. The control enclosures shall be stainless steel and vented in design to prevent trapping of moisture within the control.
- o. TPG Ground Trip Element: The minimum trip selection for each phase element and for ground element shall be independently settable. Minimum ground trip settings shall be selectable from 10 to 640 amps, in 10-amp increments. A separate instantaneous trip feature shall be provided for ground as a standard feature that shall provide a selection of 1X, 3X, 5X....15X the ground minimum trip setting for the instantaneous trip pick-up or it may be disabled. The instantaneous trip feature shall provide a fixed 0.025-second response time characteristic.
- p. The overcurrent trip response time for ground trip shall be governed by a separate time-current curve.
- q. The ground trip sensing portion of the control shall be capable of being deactivated via a ground trip block switch.
- r. The controller shall include inputs for a dry-contact remote trip signal.

10. Low-Voltage Section:

- a. Bushings with spade terminals drilled for terminating the number of conductors indicated on the Drawings, and the lugs that comply with requirements of Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

F. Capacities and Characteristics:

- 1. Power Rating (kVA): As indicated
- 2. Voltage Ratings: As indicated.
- 3. Taps: Comply with IEEE C57.12.26 requirements.
- 4. Transformer BIL (kV): Comply with IEEE C57.12.26 requirements.
- 5. Minimum Tested Impedance (Percent at 85 deg C): 4.03.
- 6. Comply with FM listing requirements for combination classification and listing for transformer and less-flammable insulating liquid.

G. Transformer Accessories:

- 1. Drain and filter connection.
- 2. Filling and top filter press connections.
- 3. Pressure-vacuum gauge.
- 4. Dial-type analog thermometer with alarm contacts.
- 5. Magnetic liquid level indicator with high and low alarm contacts.
- 6. Automatically resetting pressure-relief device. Device flow shall be as recommended by manufacturer.
- 7. Stainless-steel ground connection pads.
- 8. Machine-engraved nameplate, made of anodized aluminum or stainless steel.
- 9. Equipment ground bus bar.



## 2.4 SERVICE CONDITIONS

- A. Transformers shall be suitable for operation under service conditions specified as usual service conditions in IEEE C57.12.00, except for the following:
  - 1. Exposure to excessive moisture, including steam, salt spray, and dripping water.
  - 2. Unusual transportation or storage conditions.

## 2.5 WARNING LABELS AND SIGNS

- A. Comply with requirements for labels and signs specified in Section 260553 "Identification for Electrical Systems."
  - 1. High-Voltage Warning Label: Provide self-adhesive warning signs on outside of high-voltage compartment door(s). Sign legend shall be "DANGER HIGH VOLTAGE" printed in two lines of nominal 2-inch-high letters. The word "DANGER" shall be in white letters on a red background and the words "HIGH VOLTAGE" shall be in black letters on a white background.
  - 2. Arc Flash Warning Label: Provide self-adhesive warning signs on outside of high-voltage compartment door(s), warning of potential electrical arc flash hazards and appropriate personal protective equipment required.

## 2.6 SOURCE QUALITY CONTROL

- A. Provide manufacturer's certificate that the transformer design tests comply with IEEE C57.12.90.
  - 1. Perform the following factory-certified routine tests on each transformer for this Project:
    - a. Resistance.
    - b. Turns ratio, polarity, and phase relation.
    - c. Transformer no-load losses and excitation current at 100 percent of ratings.
    - d. Transformer impedance voltage and load loss.
    - e. Operation of all devices.
    - f. Lightning impulse.
    - g. Low frequency.
    - h. Leak.
    - i. Transformer no-load losses and excitation current at 110 percent of ratings.
    - j. Insulation power factor.
    - k. Applied potential, except that this test is not required for three-phase Y-Y-connected transformers.
    - l. Induced potential.
    - m. Resistance measurements of all windings on rated voltage connection and at tap extreme connections.
    - n. Ratios on rated voltage connection and at tap extreme connections.
    - o. Polarity and phase relation on rated voltage connection.
    - p. No-load loss at rated voltage on rated voltage connection.
    - q. Exciting current at rated voltage on rated voltage connection.
    - r. Impedance.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine pad-mounted, liquid-filled, medium-voltage transformers upon delivery.
1. Upon delivery of transformers and prior to unloading, inspect equipment for any damage that may have occurred during shipment or storage.
  2. Verify that tie rods and chains are undamaged and tight, and that all blocking and bracing is tight. Verify that there is no evidence of load shifting in transit, and that readings from transportation shock recorders, if equipped, are within manufacturer's recommendations.
  3. Verify that there is no indication of external damage and no dents or scratches in doors and sill, tank walls, radiators and fins, or termination provisions.
  4. Verify that there is no evidence of insulating-liquid leakage on transformer surfaces, at weld seams, on high- or low-voltage bushing parts, and at transformer base.
  5. Verify that there is positive pressure or vacuum on tank. Check pressure gauge; it is required to read other than zero.
  6. Compare transformers and accessories received with bill of materials to verify that shipment is complete. Verify that transformers and accessories conform with manufacturer's quotation and shop drawings. If shipment is incomplete or does not comply with Project requirements, notify manufacturer in writing immediately.
  7. Verify presence of polychlorinated biphenyl content labeling.
  8. Unload transformers carefully, observing all packing label warnings and handling instructions.
  9. Open termination compartment doors and inspect components for damage or displaced parts, loose or broken connections, cracked or chipped insulators, bent mounting flanges, dirt or foreign material, and water or moisture.
- B. Handling:
1. Handle transformers carefully, in accordance with manufacturer recommendations, to avoid damage to enclosure, termination compartments, base, frame, tank, and internal components. Do not subject transformers to impact, jolting, jarring, or rough handling.
  2. Protect transformer termination compartments against entrance of dust, rain, and snow.
  3. Transport transformers upright, to avoid internal stresses on core and coil mounting assembly and to prevent trapping air in windings. Do not tilt or tip transformers.
  4. Verify that transformer weights are within rated capacity of handling equipment.
  5. Use only manufacturer-recommended points for lifting, jacking, and pulling. Use all lifting lugs when lifting transformers.
  6. Use jacks only at corners of tank base plate.
  7. Use nylon straps of same length to balance and distribute weight when handling transformers with a crane.
  8. Use spreaders or a lifting beam to obtain a vertical lift and to protect transformer from straps bearing against enclosure. Lifting cable pull angles may not be greater than 15 degrees from vertical.
  9. Exercise care not to damage tank base structure when handling transformer using skids or rollers. Use skids to distribute stresses over tank base when using rollers under large transformers.
- C. Storage:
1. Store transformers in accordance with manufacturer's recommendations.

2. Transformers may be stored outdoors. If possible, store transformers at final installation locations on concrete pads. If dry concrete surfaces are unavailable, use pallets of adequate strength to protect transformers from direct contact with ground. Ensure transformer is level.
  3. Ensure that transformer storage location is clean and protected from severe conditions. Protect transformers from dirt, water, contamination, and physical damage. Do not store transformers in presence of corrosive or explosive gases. Protect transformers from weather when stored for more than three months.
  4. Store transformers with compartment doors closed.
  5. Regularly inspect transformers while in storage and maintain documentation of storage conditions, noting any discrepancies or adverse conditions. Verify that an effective pressure seal is maintained using pressure gauges. Visually check for insulating-liquid leaks and rust spots.
- D. Examine areas and space conditions for compliance with requirements for pad-mounted, liquid-filled, medium-voltage transformers and other conditions affecting performance of the Work.
- E. Examine roughing-in of conduits and grounding systems to verify the following:
1. Wiring entries comply with layout requirements.
  2. Entries are within conduit-entry tolerances specified by manufacturer, and no feeders will cross section barriers to reach load or line lugs.
- F. Examine concrete bases for suitable conditions for transformer installation.
- G. Pre-Installation Checks:
1. Verify removal of any shipping bracing after placement.
  2. Remove a sample of insulating liquid according to ASTM D 923. Insulating-liquid values shall comply with NETA ATS, Table 100.4. Sample shall be tested for the following:
    - a. Dielectric Breakdown Voltage: ASTM D 877 or ASTM D 1816.
    - b. Acid Neutralization Number: ASTM D 974.
    - c. Specific Gravity: ASTM D 1298.
    - d. Interfacial Tension: ASTM D 971.
    - e. Color: ASTM D 1500.
    - f. Visual Condition: ASTM D 1524.
    - g. Water in Insulating Liquids: Comply with ASTM D 1533.
    - h. Power Factor or Dissipation Factor: ASTM D 924.
- H. Verify that ground connections are in place and that requirements in Section 260526 "Grounding and Bonding for Electrical Systems" have been met. Maximum ground resistance shall be 5 ohms at transformer location.
- I. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Equipment Mounting: Install transformers on a structural concrete pad that has been designed to withstand the structural loading criteria listed on Drawing S0.0.

- B. Equipment Anchorage: Install stainless steel anchor bolts that extend through equipment and anchor into structural concrete pad. The anchor bolts are to sized and embedded to withstand the structural loading criteria listed on Drawing S0.0.
- C. Transformer shall be installed level and plumb and shall tilt less than 1.5 degrees while energized.
- D. Comply with requirements for vibration isolation specified in Section 260529 "Hangers and Supports for Electrical Systems".
- E. Maintain minimum clearances and workspace at equipment according to manufacturer's written instructions and IEEE C2.

### 3.3 CONNECTIONS

- A. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."
  - 1. For counterpoise, use tinned bare copper cable not smaller than No. 4/0 AWG, buried not less than 30 inches below grade interconnecting the grounding electrodes. Bond surge arrester and neutrals directly to transformer enclosure and then to grounding electrode system with bare copper conductors, sized as shown. Keep lead lengths as short as practicable, with no kinks or sharp bends.
  - 2. Fence and equipment connections shall not be smaller than No. 4 AWG. Ground fence at each gate post and corner post and at intervals not exceeding 10 ft. Bond each gate section to fence post using 1/8 by 1-inch flexible braided copper strap and clamps.
  - 3. Make joints in grounding conductors and loops by exothermic weld or compression connector.
  - 4. Terminate all grounding and bonding conductors on a common equipment grounding terminal on transformer enclosure.
  - 5. Complete transformer tank grounding and lightning arrester connections prior to making any other electrical connections.
- B. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
  - 1. Maintain air clearances between energized live parts and between live parts and ground for exposed connections in accordance with manufacturer recommendations.
  - 2. Bundle associated phase, neutral, and equipment grounding conductors together within transformer enclosure. Arrange conductors such that there is not excessive strain that could cause loose connections. Allow adequate slack for expansion and contraction of conductors.
- C. Terminate medium-voltage cables in incoming section of transformers according to Section 260513 "Medium-Voltage Cables."

### 3.4 SIGNS AND LABELS

- A. Comply with installation requirements for labels and signs specified in Section 260553 "Identification for Electrical Systems."

- B. Install warning signs as required to comply with 29 CFR 1910.269.

### 3.5 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- B. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
  - 1. General Field-Testing Requirements:
    - a. Comply with provisions of NFPA 70B Ch. "Testing and Test Methods."
    - b. Perform each visual and mechanical inspection and electrical test. Certify compliance with test parameters.
    - c. After installing transformer but before primary is energized, verify that grounding system at the transformer is tested at specified value or less.
    - d. After installing transformer and after electrical circuitry has been energized, test for compliance with requirements.
    - e. Visual and Mechanical Inspection:
      - 1) Verify equipment nameplate data complies with Contract Documents.
      - 2) Inspect bolted electrical connections for high resistance using one of the following two methods:
        - a) Use a low-resistance ohmmeter to compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
        - b) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method according to manufacturer's published data or NETA ATS, Table 100.12. Bolt-torque levels shall be according to manufacturer's published data. In absence of manufacturer's published data, use NETA ATS, Table 100.12.
    - f. Remove and replace malfunctioning units and retest.
    - g. Prepare test and inspection reports. Record as-left set points of all adjustable devices.
  - 2. Medium-Voltage Surge Arrester Field Tests:
    - a. Visual and Mechanical Inspection:
      - 1) Inspect physical and mechanical condition.
      - 2) Verify arresters are clean.
      - 3) Verify that ground lead on each device is individually attached to a ground bus or ground electrode.
    - b. Electrical Test:
      - 1) Perform an insulation-resistance test on each arrester, phase terminal-to-ground. Apply voltage according to manufacturer's published data. In the absence of manufacturer's published data, comply with NETA ATS, Table 100.1. Replace units that fail to comply with recommended minimum insulation resistance listed in that table.
      - 2) Perform a watts-loss test. Evaluate watts-loss values by comparison with similar units and test equipment manufacturer's published data.
  - 3. Liquid-Filled Transformer Field Tests:
    - a. Visual and Mechanical Inspection:
      - 1) Test dew point of tank gases if applicable.

- 2) Inspect anchorage, alignment, and grounding.
  - 3) Verify bushings are clean.
  - 4) Verify that alarm, control, and trip settings on temperature and level indicators are set and operate within manufacturer's recommended settings.
  - 5) Verify that liquid level in tanks is within manufacturer's published tolerances.
  - 6) Perform specific inspections and mechanical tests recommended by manufacturer.
  - 7) Verify presence of transformer surge arresters and that their ratings are as specified.
  - 8) Verify that as-left tap connections are as specified.
- b. Electrical Tests:
- 1) Perform insulation-resistance tests winding-to-winding and each winding-to-ground. Apply voltage according to manufacturer's published data. In the absence of manufacturer's published data, comply with NETA ATS, Table 100.5. Calculate polarization index; the value of the index shall not be less than 1.0.
  - 2) Perform power-factor or dissipation-factor tests on all windings according to test equipment manufacturer's published data. Maximum winding insulation power-factor/dissipation-factor values shall be according to manufacturer's published data. In the absence of manufacturer's published data, comply with NETA ATS, Table 100.3.
  - 3) Measure core insulation resistance at 500-V dc if the core is insulated and the core ground strap is removable. Core insulation-resistance values shall not be less than 1 megohm at 500-V dc.
  - 4) Perform a power-factor or dissipation-factor tip-up test on windings greater than 2.5 kV.
  - 5) Perform turns-ratio tests at tap positions. Turns-ratio test results shall not deviate by more than one-half percent from either adjacent coils or calculated ratio. If test fails, replace transformer.
  - 6) Perform an excitation-current test on each phase. The typical excitation-current test data pattern for a three-legged core transformer is two similar current readings and one lower current reading. Investigate and correct if test shows a different pattern.
  - 7) Measure resistance of each winding at each tap connection, and record temperature-corrected winding-resistance values in the Operations and Maintenance Manual.
  - 8) Perform an applied-voltage test on high- and low-voltage windings-to-ground. Comply with IEEE C57.12.91, Sections 10.2 and 10.9. This test is not required for three-phase Y-Y-connected transformers.
  - 9) Verify correct secondary voltage, phase-to-phase and phase-to-neutral, after energization and prior to loading.
  - 10) Remove a sample of insulating liquid according to ASTM D 923, and perform dissolved-gas analysis according to IEEE C57.104 or ASTM D 3612.

### 3.6 FOLLOW-UP SERVICE

- A. Voltage Monitoring and Adjusting: After Substantial Completion, if requested by Owner, but not more than six months after Final Acceptance, perform the following voltage monitoring:
1. During a period of normal load cycles as evaluated by Owner, perform seven days of three-phase voltage recording at the outgoing section of each transformer. Use voltmeters with calibration traceable to the National Institute of Science and Technology standards and with a chart speed of not less than 1 inch (25 mm) per hour. Voltage unbalance greater than 1 percent between phases, or deviation of any phase voltage from the nominal value by more than plus or minus 5 percent during test period, is unacceptable.
  2. Corrective Action: If test results are unacceptable, perform the following corrective action, as appropriate:
    - a. Adjust transformer taps.
    - b. Prepare written request for voltage adjustment by electric utility.
  3. Retests: Repeat monitoring, after corrective action is performed, until satisfactory results are obtained.
  4. Report:
    - a. Prepare a written report covering monitoring performed and corrective action taken.
- B. Infrared Inspection: Perform survey during periods of maximum possible loading. Remove all necessary covers prior to inspection.
1. After Substantial Completion, but not more than 60 days after Final Acceptance, perform infrared inspection of transformer's electrical power connections.
  2. Instrument: Inspect distribution systems with imaging equipment capable of detecting a minimum temperature difference of 1°C at 30°C.
  3. Record of Infrared Inspection: Prepare a certified report that identifies testing technician and equipment used, and lists results as follows:
    - a. Description of equipment to be tested.
    - b. Discrepancies.
    - c. Temperature difference between area of concern and reference area.
    - d. Probable cause of temperature difference.
    - e. Areas inspected. Identify inaccessible and unobservable areas and equipment.
    - f. Identify load conditions at time of inspection.
    - g. Provide photographs and thermograms of deficient area.
  4. Act on inspection results according to recommendations of NETA ATS, Table 100.18. Correct possible and probable deficiencies as soon as Owner's operations permit. Retest until deficiencies are corrected.

### 3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain systems.

END OF SECTION 26 12 19

## SECTION 26 13 23 - MEDIUM-VOLTAGE, METAL-ENCLOSED SWITCHGEAR

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes outdoor metal-enclosed, pad mounted, interrupter switchgear.

#### 1.3 DEFINITIONS

- A. BIL: Basic Impulse Insulation Level.
- B. SCADA: Supervisory control and data acquisition.
- C. VFI: Vacuum fault interrupter

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include rated capacities, operating characteristics, and furnished specialties and accessories.
  - 2. Time-current characteristic curves for overcurrent protective devices.
- B. Shop Drawings: For medium-voltage, metal-enclosed switchgear.
  - 1. Include a tabulation of installed devices with features and ratings.
  - 2. Include dimensioned plans and elevations, showing dimensions, shipping sections, and weights of each assembled section. Elevations shall show major components, features, and mimic bus diagram.
  - 3. Include a plan view and cross section of equipment base showing clearances, manufacturer's recommended work space, and locations of penetrations for grounding and conduits. Show location of anchor bolts.
  - 4. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, and location and size of each field connection.
  - 5. Locate accessory and spare equipment storage.
  - 6. Include single-line diagram.
  - 7. Include control power wiring diagrams.
  - 8. Include copy of nameplate.
  - 9. Ratings of the assembled switchgear:
    - a. Voltage.
    - b. Continuous current.



- c. Short-circuit rating.
- d. BIL.
- 10. Utility company's metering provisions with indication of approval by utility company.
- 11. Wiring Diagrams: For each switchgear assembly include the following:
  - a. Power, signal, and control wiring.
  - b. Three-line diagrams of current and future secondary circuits showing device terminal numbers and internal diagrams.
  - c. Schematic control diagrams.
  - d. Diagrams showing connections of component devices and equipment.
  - e. Schematic diagrams showing connections to remote devices.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings for Outdoor Installations:
  - 1. Utilities site plan, drawn to scale, showing heavy equipment or truck access paths for maintenance and replacement.
- B. Seismic Qualification Certificates: For switchgear and control power, accessories, and components, from manufacturer.
  - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
  - 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
  - 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- C. Product Certificates: For switchgear, signed by product manufacturer.
- D. Source quality-control reports.
- E. Field quality-control reports.

#### 1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For switchgear and switchgear components to include in emergency, operation, and maintenance manuals. Include the following:
  - 1. Product name, make, and model number.
  - 2. Operating standards.
  - 3. Operating procedures.
  - 4. Precautions against improper use.
  - 5. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
  - 6. Time-current curves, including selectable ranges for each type of overcurrent protective device.

## 1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Spare Fuses: Six of each type and rating of fuse and fusible device used.
  - 2. Spare Indicating Lights: Six of each type installed.
  - 3. Touchup Paint: Three half-pint containers of paint matching enclosure's exterior finish.
  - 4. Primary Switch Contact Lubricant: One container.

## 1.8 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.
  - 1. Testing Agency's Field Supervisor: Certified by the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site specified in "Field Quality Control" Article.
- B. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, and that is an NRTL as defined by OSHA in 29 CFR 1910.7.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Cooper Power Systems.
- B. S&C
- C. Or approved equal.

### 2.2 SYSTEM DESCRIPTION

- A. Manufactured Unit: Metal-enclosed switchgear, designed for application in solidly grounded neutral system.
- B. Switchgear Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Comply with IEEE C37.60-2003, IEEE 386-1995, IEEE C37.90.2, IEEE C57.12.00, IEEE C57.12.29.

### 2.3 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: The switchgear shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
  - 1. Component Importance Factor: 1.0.
  - 2. Component Amplification Factor: 2.5.
  - 3. Component Response Modification Factor: 6.0.

- B. Service Conditions:
  - 1. Switchgear shall be suitable for operation under service conditions specified as usual service conditions in IEEE C37.20.3, except for the following:
    - a. Exposure to salt air.

## 2.4 SWITCHGEAR ENCLOSURE

- A. Outdoor Enclosure: Weatherproof. Comply with IEEE C57.12.29.
- B. Switchgear Enclosures Finish: Factory-applied finish in manufacturer's standard color.

## 2.5 LOAD INTERRUPTER SWITCHGEAR WITH CIRCUIT BREAKERS

- A. Cooper Power Systems VFI or approved equal.
- B. Ratings and features:
  - 1. 15 kV nominal voltage.
  - 2. 15.5 kV maximum design voltage.
  - 3. 95 kV BIL.
  - 4. 35kV 1-minute withstand
  - 5. 600A continuous current rating.
  - 6. 600A load switching.
  - 7. 12.5 kA symmetrical interrupting rating.
  - 8. 3-phase.
  - 9. 600A source and tap bushings.
  - 10. Pad Mounted.
  - 11. 304L stainless steel construction.
  - 12. Double sided.
  - 13. Vacuum fault interrupter.
  - 14. Four way with (2) load break switch ways, (1) vacuum fault interrupter, and (1) unswitched way.
  - 15. Three phase ganged trip fault interrupter.
  - 16. Microprocessor based multifunction protective relay with overcurrent protection, ground fault protection, and metering. Edison idea iDP-210 relay or approved equal.
- C. Surge Arresters: Comply with IEEE C62.11, distribution class; metal-oxide-varistor type, connected in each phase of incoming circuit and ahead of disconnecting device.
- D. Accessory Set: Tools and miscellaneous items required for interrupter switchgear test, inspection, maintenance, and operation.

## 2.6 LOAD INTERRUPTER SWITCHGEAR WITHOUT CIRCUIT BREAKERS

- A. Ratings and features:
  - 1. 15 kV nominal voltage.
  - 2. 15.5 kV maximum design voltage.
  - 3. 95 kV BIL.
  - 4. 35kV 1-minute withstand.

5. 600A continuous current rating.
  6. 200A load switching.
  7. 12.5 kA symmetrical interrupting rating.
  8. 3-phase.
  9. 200A source and tap bushings.
  10. Pad Mounted.
  11. 304L stainless steel construction.
  12. Double sided.
  13. FR3 or E200 less flammable liquid insulating fluid.
- B. Surge Arresters: Comply with IEEE C62.11, distribution class; metal-oxide-varistor type, connected in each phase of incoming circuit and ahead of disconnecting device.
- C. Accessory Set: Tools and miscellaneous items required for interrupter switchgear test, inspection, maintenance, and operation.

## 2.7 INSTRUMENTS

- A. Instrument Transformers: Comply with IEEE C57.13.
1. Potential Transformers: Secondary voltage rating of 120 V and NEMA C 12.11 accuracy class of 0.3 with burdens of W, X, and Y.
  2. Current Transformers: Burden and accuracy class suitable for connected relays, meters, and instruments.
- B. Multifunction Digital Meter and Monitor: Microprocessor-based unit suitable for three- or four-wire systems.
1. Inputs from sensors or 5-A current-transformer secondaries, and potential terminals rated to 600 V.
  2. Switch-selectable digital display with the following features:
    - a. Phase Currents, Each Phase: Plus or minus 1 percent.
    - b. Phase-to-Phase Voltages, Three Phase: Plus or minus 1 percent.
    - c. Phase-to-Neutral Voltages, Three Phase: Plus or minus 1 percent.
    - d. Three-Phase Real Power: Plus or minus 2 percent.
    - e. Three-Phase Reactive Power: Plus or minus 2 percent.
    - f. Power Factor: Plus or minus 2 percent.
    - g. Frequency: Plus or minus 0.5 percent.
    - h. Integrated Demand, with Demand Interval Selectable from 5 to 60 Minutes: Plus or minus 2 percent.

## 2.8 WARNING LABELS AND SIGNS

- A. Comply with requirements for labels and signs specified in Section 260553 "Identification for Electrical Systems."
1. Warning signs shall be baked enamel.
  2. Equipment Identification Labels: Engraved, laminated acrylic or melamine label.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Upon delivery of switchgear and prior to unloading, inspect equipment for damage.
  - 1. Examine tie rods and chains to verify they are undamaged and tight and that blocking and bracing are tight.
  - 2. Verify that there is no evidence of load shifting in transit and that readings from transportation shock recorders, if equipped, are within manufacturer's recommendations.
  - 3. Examine switchgear for external damage, including dents or scratches in doors and sill, and termination provisions.
  - 4. Compare switchgear and accessories received with the bill of materials to verify that the shipment is complete. Verify that switchgear and accessories conform to the manufacturer's quotation and shop drawings. If the shipment is not complete or does not comply with project requirements, notify the manufacturer in writing immediately.
  - 5. Unload switchgear, observing packing label warnings and handling instructions.
  - 6. Open compartment doors and inspect components for damage or displaced parts, loose or broken connections, cracked or chipped insulators, bent mounting flanges, dirt or foreign material, and water or moisture.
  
- B. Handling:
  - 1. Handle switchgear according to manufacturer's recommendations; avoid damage to the enclosure, termination compartments, base, frame, tank, and internal components. Do not subject switchgear to impact, jolting, jarring, or rough handling.
  - 2. Protect switchgear compartments against the entrance of dust, rain, and snow.
  - 3. Transport switchgear upright to avoid internal stresses on equipment mounting assemblies. Do not tilt or tip switchgear.
  - 4. Use spreaders or a lifting beam to obtain a vertical lift and to protect switchgear from straps bearing against the enclosure. Lifting cable pull angles may not be greater than 15 degrees from vertical.
  - 5. Do not damage structure when handling switchgear.
  
- C. Storage:
  - 1. Store switchgear in a location that is clean and protected from weather. Protect switchgear from dirt, water, contamination, and physical damage. Do not store switchgear in the presence of corrosive or explosive gases.
  - 2. Store switchgear with compartment doors closed.
  - 3. Regularly inspect switchgear while in storage and maintain documentation of storage conditions, noting any discrepancies or adverse conditions.
  
- D. Examine roughing-in of conduits and grounding systems to verify the following:
  - 1. Wiring entries comply with layout requirements.
  - 2. Entries are within conduit-entry tolerances specified by manufacturer, and no feeders will have to cross section barriers to reach load or line lugs.
  
- E. Pre-Installation Checks:
  - 1. Verify removal of any shipping bracing after placement.

- F. Verify that ground connections are in place and that requirements in Section 260526 "Grounding and Bonding for Electrical Systems" have been met. Maximum ground resistance shall be 5 ohms at switchgear location.
- G. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 SWITCHGEAR INSTALLATION

- A. Equipment Mounting: Install switchgear on a structural concrete pad that has been designed to withstand the structural loading criteria listed on Drawing S0.0.
- B. Equipment Anchorage: Install stainless steel anchor bolts that extend through equipment and anchor into structural concrete pad. The anchor bolts are to sized and embedded to withstand the structural loading criteria listed on Drawing S0.0.
- C. Switchgear shall be installed level and plumb. Switchgear shall tilt less than 1.5 degrees while energized.
- D. Maintain minimum clearances and workspace at equipment according to manufacturer's written instructions and NFPA 70.
- E. Comply with NECA 1.
- F. Comply with NECA 430.

### 3.3 CONNECTIONS

- A. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."
- B. Grounding Connections at Exterior Locations:
  - 1. Install tinned bare copper cable not smaller than No. 4/0 AWG, for counterpoise buried not less than 30 inches below grade interconnecting the grounding electrodes.
  - 2. Bond surge arrester and neutrals directly to the switchgear enclosure and then to the grounding electrode system with bare copper conductors, sized as shown.
  - 3. Keep lead lengths as short as practicable with no kinks or sharp bends.
  - 4. Make joints in grounding conductors and loops by exothermic weld or compression connector.
- C. Terminate all grounding and bonding conductors on a common equipment grounding terminal on the switchgear enclosure. Install supplemental terminal bars, lugs, and bonding jumpers as required to accommodate the number of conductors for termination.
- D. Complete switchgear grounding and lightning arrester connections prior to making any other electrical connections.
- E. Terminate medium-voltage cables according to Section 260513 "Medium-Voltage Cables."

### 3.4 SIGNS AND LABELS

- A. Comply with the installation requirements for labels and signs specified in Section 260553 "Identification for Electrical Systems."
- B. Install warning signs as required to comply with OSHA in 29 CFR 1910.269.

### 3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
- D. General Field Testing Requirements:
  - 1. Comply with the provisions of NFPA 70B, "Testing and Test Methods."
  - 2. After installing switchgear and after electrical circuitry has been energized, test for compliance with requirements.
  - 3. Perform each visual and mechanical inspection and electrical test. Certify compliance with test parameters.
- E. Medium-Voltage Switchgear Assembly Field Tests:
  - 1. Visual and Mechanical Inspection:
    - a. Verify that fuse and circuit breaker sizes and types correspond to Drawings and coordination study.
    - b. Verify that current and voltage transformer ratios correspond to Shop Drawings.
    - c. Inspect bolted electrical connections for high resistance using one of the following two methods:
      - 1) Use a low-resistance ohmmeter to compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
      - 2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method according to manufacturer's published data or NETA ATS, Table 100.12. Bolt-torque levels shall be according to manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS, Table 100.12.
    - d. Confirm correct operation and sequencing of electrical and mechanical interlock systems.
      - 1) Attempt closure on locked-open devices. Attempt to open locked-closed devices.
      - 2) Make key exchange with devices operated in off-normal positions.
    - e. Verify appropriate lubrication on moving current-carrying parts and on moving and sliding surfaces.
    - f. Inspect insulators for evidence of physical damage or contaminated surfaces.
    - g. Verify correct barrier and shutter installation and operation.
    - h. Exercise active components.

- i. Inspect mechanical indicating devices for correct operation.
- j. Verify that filters are in place and vents are clear.
- k. Perform visual and mechanical inspection of instrument transformers according to Article "Instrument Transformer Field Tests."
- l. Inspect control power transformers.
  - 1) Inspect for physical damage, cracked insulation, broken leads, tightness of connections, defective wiring, and overall general condition.
  - 2) Verify that primary and secondary fuse or circuit breaker ratings match drawings.
  - 3) Verify correct functioning of drawout disconnecting and grounding contacts and interlocks.
2. Electrical Tests:
  - a. Perform dc voltage insulation-resistance tests on each bus section, phase to phase and phase to ground, for one minute. If the temperature of the bus is other than plus or minus 20 deg C, adjust the resulting resistance as provided in NETA ATS, Table 100.11.
    - 1) Insulation-resistance values of bus insulation shall be according to manufacturer's published data. In the absence of manufacturer's published data, comply with NETA ATS, Table 100.1. Investigate and correct values of insulation resistance less than manufacturer's recommendations or NETA ATS, Table 100.1.
    - 2) Do not proceed to the dielectric withstand voltage tests until insulation-resistance levels are raised above minimum values.
  - b. Perform a dielectric withstand voltage test on each bus section, each phase to ground with phases not under test grounded, according to manufacturer's published data. If manufacturer has no recommendation for this test, it shall be conducted according to NETA ATS, Table 100.2. Apply the test voltage for one minute.
    - 1) If no evidence of distress or insulation failure is observed by the end of the total time of voltage application during the dielectric withstand test, the test specimen is considered to have passed the test.
  - c. Perform insulation-resistance tests on control wiring with respect to ground. Applied potential shall be 500 volts dc for 300-volt rated cable and 1000 V dc for 600-V rated cable. Test duration shall be one minute. For units with solid-state components or control devices that cannot tolerate the applied voltage, follow the manufacturer's recommendation.
    - 1) Minimum insulation-resistance values of control wiring shall not be less than two megohms.
  - d. Control Power Transformers:
    - 1) Perform insulation-resistance tests. Perform measurements from winding to winding and each winding to ground. Insulation-resistance values of winding insulation shall be according to manufacturer's published data. In the absence of manufacturer's published data, comply with NETA ATS, Table 100.1. Investigate and correct values of insulation resistance less than manufacturer's recommendations or NETA ATS, Table 100.1.
    - 2) Perform secondary wiring integrity test. Disconnect transformer at secondary terminals and connect secondary wiring to a rated secondary voltage source. Verify correct potential at all devices.
    - 3) Verify correct secondary voltage by energizing the primary winding with system voltage. Measure secondary voltage with the secondary wiring disconnected.



- 4) Verify correct function of control transfer relays located in the switchgear with multiple control power sources.
  - e. Voltage Transformers:
    - 1) Perform secondary wiring integrity test. Verify correct potential at all devices.
    - 2) Verify secondary voltages by energizing the primary winding with system voltage.
  - f. Perform current-injection tests on the entire current circuit in each section of switchgear.
    - 1) Perform current tests by secondary injection with magnitudes such that a minimum current of 1.0 A flows in the secondary circuit. Verify correct magnitude of current at each device in the circuit.
    - 2) Perform current tests by primary injection with magnitudes such that a minimum of 1.0 A flows in the secondary circuit. Verify correct magnitude of current at each device in the circuit.
  - g. Perform system function tests according to "System Function Tests" Article.
  - h. Verify operation of space heaters.
  - i. Perform phasing checks on double-ended or dual-source switchgear to ensure correct bus phasing from each source.
- F. Medium-Voltage Vacuum Circuit Breaker Field Tests:
- 1. Visual and Mechanical Inspection:
    - a. Inspect physical and mechanical condition.
    - b. Inspect anchorage, alignment, grounding, and required clearances.
    - c. Verify that maintenance devices such as special tools and gages specified by the manufacturer are available for servicing and operating the breaker.
    - d. Verify the unit is clean.
    - e. Perform mechanical operation tests on operating mechanism according to manufacturer's published data.
    - f. Measure critical distances on operating mechanism as recommended by the manufacturer. Critical distances of the operating mechanism shall be according to manufacturer's published data.
    - g. Verify cell fit and element alignment.
    - h. Verify racking mechanism operation.
    - i. Verify appropriate lubrication on moving current-carrying parts and on moving and sliding surfaces.
    - j. Verify appropriate lubrication on moving current-carrying parts and on moving and sliding surfaces.
    - k. Perform time-travel analysis. Travel and velocity values shall be according to manufacturer's published data.
    - l. Record as-found and as-left operation counter reading. Operation counter shall advance one digit per close-open cycle.
  - 2. Electrical Tests:
    - a. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to ground with switch closed, and across each open pole. Apply voltage according to manufacturer's published data. In the absence of manufacturer's published data, comply with NETA ATS, Table 100.1. Insulation-resistance values shall be according to manufacturer's published data. In the absence of manufacturer's published data, comply with NETA ATS, Table 100.1. Investigate and correct values of insulation resistance less than this table or manufacturer's

recommendations. Dielectric-withstand-voltage tests shall not proceed until insulation-resistance levels are raised above minimum values.

- b. Perform a contact/pole-resistance test. Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value. Microhm or dc millivolt drop values shall not exceed the high levels of the normal range according to manufacturer's published data. If manufacturer's published data is not available, investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
- c. Perform minimum pickup voltage tests on trip and close coils according to manufacturer's published data. Minimum pickup voltage of the trip and close coils shall comply with manufacturer's published data. In the absence of the manufacturer's published data, comply with NETA ATS, Table 100.20.
- d. Verify correct operation of any auxiliary features, such as electrical close and trip operation, trip-free operation, and anti-pump function. Auxiliary features shall operate according to manufacturer's published data.
- e. Trip circuit breaker by operation of each protective device. Reset trip logs and indicators.
- f. Perform power-factor or dissipation-factor tests on each pole with the breaker open and each phase with the breaker closed. Power-factor or dissipation-factor values shall comply with manufacturer's published data.
- g. Perform vacuum bottle integrity (dielectric-withstand-voltage) test across each vacuum bottle, with the contacts in the "open" position according to manufacturer's published data. If no evidence of distress or insulation failure is observed by the end of the total time of voltage application during the vacuum bottle integrity test, the test specimen is considered to have passed the test.
- h. Perform a dielectric-withstand-voltage test according to manufacturer's published data. If no evidence of distress or insulation failure is observed by the end of the total time of voltage application during the dielectric-withstand-voltage test, the test specimen is considered to have passed the test.
- i. Verify operation of heaters.

G. Instrument Transformer Field Tests:

1. Visual and Mechanical Inspection:
  - a. Verify that equipment nameplate data complies with Contract Documents.
  - b. Inspect physical and mechanical condition.
  - c. Verify correct connection of transformers with system requirements.
  - d. Verify that adequate clearances exist between primary and secondary circuit wiring.
  - e. Verify the unit is clean.
  - f. Inspect bolted electrical connections for high resistance using one of the following two methods:
    - 1) Use a low-resistance ohmmeter to compare bolted connection resistance values to values of similar connections.
    - 2) Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
  - g. Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method according to manufacturer's published data or NETA ATS, Table 100.12. Bolt-torque levels shall be according to manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS, Table 100.12.
  - h. Verify that required grounding and shorting connections provide contact.

- i. Verify correct operation of transformer withdrawal mechanism and grounding operation.
  - j. Verify correct primary and secondary fuse sizes for voltage transformers.
  - k. Verify appropriate lubrication on moving current-carrying parts and on moving and sliding surfaces.
2. Electrical Tests of Current Transformers:
- a. Perform insulation-resistance test of each current transformer and its secondary wiring with respect to ground at 1000 V dc for one minute. For units with solid-state components that cannot tolerate the applied voltage, follow manufacturer's written recommendations. Investigate and correct values of insulation resistance less than manufacturer's recommendations or NETA ATS, Table 100.5.
  - b. Perform a polarity test of each current transformer according to IEEE C57.13.1. Polarity results shall agree with transformer markings.
  - c. Perform a ratio-verification test using the voltage or current method according to IEEE C57.13.1. Ratio errors shall be according to IEEE C57.13.
  - d. Perform an excitation test on transformers used for relaying applications according to IEEE C57.13.1. Excitation results shall match the curve supplied by the manufacturer or be according to IEEE C57.13.1.
  - e. Measure current circuit burdens at transformer terminals according to IEEE C57.13.1. Measured burdens shall be compared with and shall match instrument transformer ratings.
  - f. Perform insulation-resistance tests on the primary winding with the secondary grounded. Test voltages shall be according to Table 100.5.
  - g. Perform dielectric withstand tests on the primary winding with the secondary grounded. Test voltages shall be according to Table 100.9.
  - h. Perform power-factor or dissipation-factor tests according to test equipment manufacturer's published data.
  - i. Verify that current transformer secondary circuits are grounded and have only one grounding point according to IEEE C57.13.3. That grounding point should be located as specified by the engineer in the project drawings.
3. Electrical Tests of Voltage Transformers:
- a. Perform insulation-resistance tests winding-to-winding and each winding to ground. Test voltages shall be applied for one minute according to Table 100.5. For units with solid-state components that cannot tolerate the applied voltage, follow manufacturer's recommendations. Investigate and correct values of insulation resistance less than manufacturer's recommendations or NETA ATS, Table 100.5.
  - b. Perform a polarity test on each transformer to verify the polarity marks or H1- X1 relationship as applicable. Polarity results shall agree with transformer markings.
  - c. Perform a turns-ratio test on all tap positions. Ratio errors shall be according to IEEE C57.13.
  - d. Measure voltage circuit burdens at transformer terminals. Measured burdens shall be compared with and shall match instrument transformer ratings.
  - e. Perform a dielectric withstand test on the primary windings with the secondary windings connected to ground. The dielectric voltage shall be according to Table 100.9. The test voltage shall be applied for one minute. If no evidence of distress or insulation failure is observed by the end of the total time of voltage application during the dielectric withstand test, the primary windings are considered to have passed the test.
  - f. Perform power-factor or dissipation-factor tests according to test equipment manufacturer's published data. Power-factor or dissipation-factor values shall be

according to manufacturer's published data. In the absence of manufacturer's published data, use test equipment manufacturer's published data.

- g. Verify that voltage transformer secondary circuits are grounded and have only one grounding point according to IEEE C57.13.3. Test results shall indicate that the circuits are grounded at only one point.

H. Ground Resistance Test:

1. Visual and Mechanical Inspection:
  - a. Verify ground system complies with the Contract Documents and NFPA 70 Article 250, "Grounding and Bonding."
  - b. Inspect physical and mechanical condition. Grounding system electrical and mechanical connections shall be free of corrosion.
  - c. Inspect bolted electrical connections for high resistance using one of the following two methods:
    - 1) Use a low-resistance ohmmeter to compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
    - 2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method according to manufacturer's published data or NETA ATS, Table 100.12. Bolt-torque levels shall be according to manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS, Table 100.12.
  - d. Inspect anchorage.
2. Electrical Tests:
  - a. Perform fall-of-potential or alternative test according to IEEE 81 on the main grounding electrode or system. The resistance between the main grounding electrode and ground shall be no more than 5 ohms.
  - b. Perform point-to-point tests to determine the resistance between the main grounding system and all major electrical equipment frames, system neutral, and derived neutral points. Investigate point-to-point resistance values that exceed 0.5 ohms. Compare equipment nameplate data with Contract Documents.
  - c. Inspect physical and mechanical condition.
  - d. Inspect bolted electrical connections for high resistance using one of the following two methods:

I. Metering Devices Field Tests:

1. Visual and Mechanical Inspection:
  - a. Inspect physical and mechanical condition.
  - b. Inspect bolted electrical connections for high resistance using one of the following methods:
    - 1) Use a low-resistance ohmmeter to compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
    - 2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method according to manufacturer's published data or NETA ATS, Table 100.12. Bolt-torque levels shall be according to manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS, Table 100.12.

- c. Inspect cover gasket, cover glass, condition of spiral spring, disk clearance, contacts, and case shorting contacts, as applicable.
  - d. Verify the unit is clean.
  - e. Verify freedom of movement, end play, and alignment of rotating disk(s).
2. Electrical Tests:
    - a. Verify accuracy of meters at all cardinal points. Meter accuracy shall be according to manufacturer's published data.
    - b. Calibrate meters according to manufacturer's published data. Calibration results shall be within manufacturer's published tolerances.
    - c. Verify all instrument multipliers. Instrument multipliers shall be according to system design specifications.
    - d. Verify that current transformer and voltage transformer secondary circuits are intact. Test results shall confirm the integrity of the secondary circuits of current and voltage transformers.
- J. Medium-Voltage Surge Arrester Field Tests:
1. Visual and Mechanical Inspection:
    - a. Verify that equipment nameplate data complies with Contract Documents.
    - b. Inspect physical and mechanical condition.
    - c. Inspect anchorage, alignment, grounding, and clearances.
    - d. Verify the arresters are clean.
    - e. Verify that the ground lead on each device is individually attached to a ground bus or ground electrode.
    - f. Verify that the stroke counter is correctly mounted and electrically connected if applicable. Record the stroke counter reading.
  2. Electrical Test:
    - a. Perform an insulation-resistance test on each arrester, phase terminal to ground. Apply voltage according to manufacturer's published data. In the absence of manufacturer's published data, comply with NETA ATS, Table 100.1. Replace units that fail to meet recommended minimum insulation resistance listed in the table.
    - b. Perform a watts-loss test. Evaluate watts-loss values by comparison with similar units and test equipment manufacturer's published data.
    - c. Test grounding connections. Resistance between the arrester ground terminal and the ground system shall be less than 0.5 ohm.
- K. Microprocessor-Based Protective Relay Field Tests:
1. Visual and Mechanical Inspection:
    - a. Record model number, style number, serial number, firmware revision, software revision, and rated control voltage.
    - b. Verify operation of light-emitting diodes, display, and targets.
    - c. Record passwords for each access level.
    - d. Clean the front panel and remove foreign material from the case.
    - e. Check tightness of connections.
    - f. Verify that the frame is grounded according to manufacturer's instructions.
    - g. Set the relay according to results in Section 260573 "Overcurrent Protective Device Coordination Study" and in Section 260574 "Overcurrent Protective Device Arc-Flash Study."
    - h. Download settings from the relay. Print a copy of the settings for the report and compare the settings to those specified in the coordination study.
  2. Electrical Tests:

- a. Perform insulation-resistance tests from each circuit to the grounded frame according to manufacturer's published data.
- b. Apply voltage or current to analog inputs and verify correct registration of the relay meter functions.
- c. Functional Operation: Check functional operation of each element used in the protection scheme as follows:
  - 1) Timing Relay:
    - a) Determine time delay.
    - b) Verify operation of instantaneous contacts.
  - 2) Volts/Hertz Relay:
    - a) Determine pickup frequency at rated voltage.
    - b) Determine pickup frequency at a second voltage level.
    - c) Determine time delay.
  - 3) Undervoltage Relay:
    - a) Determine dropout voltage.
    - b) Determine time delay.
    - c) Determine time delay at a second point on the timing curve for inverse time relays.
  - 4) Negative Sequence Current Relay:
    - a) Determine negative sequence alarm level.
    - b) Determine negative sequence minimum trip level.
    - c) Determine maximum time delay.
    - d) Verify two points on the I-two-squared-t curve.
  - 5) Instantaneous Overcurrent Relay:
    - a) Determine pickup.
    - b) Determine dropout.
    - c) Determine time delay.
  - 6) Time Overcurrent:
    - a) Determine minimum pickup.
    - b) Determine time delay at two points on the time current curve.
  - 7) Ground Detector Relay:
    - a) Determine maximum impedance to ground causing relay pickup.
  - 8) In-Service Monitoring: After the equipment is initially energized, measure magnitude and phase angle of inputs and verify expected values.
- L. Switchgear will be considered defective if it does not pass tests and inspections.
- M. Remove and replace defective units and retest.
- N. Prepare test and inspection reports. Record as-left set points of adjustable devices.

### 3.6 SYSTEM FUNCTION TESTS

- A. System function tests shall prove the correct interaction of sensing, processing, and action devices. Perform system function tests after field quality control tests have been completed and all components have passed specified tests.
  1. Develop test parameters and perform tests for the purpose of evaluating performance of integral components and their functioning as a complete unit within design requirements and manufacturer's published data.

2. Verify the correct operation of interlock safety devices for fail-safe functions in addition to design function.
3. Verify the correct operation of sensing devices, alarms, and indicating devices.

### 3.7 FOLLOW-UP SERVICE

- A. Infrared Inspection: Perform the survey during periods of maximum possible loading. Remove covers prior to the inspection.
  1. After Substantial Completion, but not more than 60 days after Final Acceptance, perform infrared inspection of the electrical power connections of the switchgear.
  2. Instrument: Inspect distribution systems with imaging equipment capable of detecting a minimum temperature difference of 1°C at 30°C.
  3. Record of Infrared Inspection: Prepare a certified report that identifies the testing technician and equipment used and lists the results as follows:
    - a. Description of equipment to be tested.
    - b. Discrepancies.
    - c. Temperature difference between the area of concern and the reference area.
    - d. Probable cause of temperature difference.
    - e. Areas inspected. Identify inaccessible and unobservable areas and equipment.
    - f. Identify load conditions at time of inspection.
    - g. Provide photographs and thermograms of the deficient area.
  4. Act on inspection results according to the recommendations of NETA ATS, Table 100.18. Correct possible and probable deficiencies as soon as Owner's operations permit. Retest until deficiencies are corrected.

### 3.8 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain systems.

END OF SECTION 26 13 23

## SECTION 26 24 13 - SWITCHBOARDS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  1. Service and distribution switchboards rated 600 V and less.
  2. Surge protection devices.
  3. Disconnecting and overcurrent protective devices.
  4. Instrumentation.
  5. Control power.
  6. Accessory components and features.
  7. Identification.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each switchboard, overcurrent protective device, surge protection device, ground-fault protector, accessory, and component.
  1. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
- B. Shop Drawings: For each switchboard and related equipment.
  1. Include dimensioned plans, elevations, sections, and details, including required clearances and service space around equipment. Show tabulations of installed devices, equipment features, and ratings.
  2. Detail enclosure types for types other than NEMA 250, Type 1.
  3. Detail bus configuration, current, and voltage ratings.
  4. Detail short-circuit current rating of switchboards and overcurrent protective devices.
  5. Include descriptive documentation of optional barriers specified for electrical insulation and isolation.
  6. Detail utility company's metering provisions with indication of approval by utility company.
  7. Include evidence of NRTL listing for series rating of installed devices.
  8. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
  9. Include time-current coordination curves for each type and rating of overcurrent protective device included in switchboards. Submit on translucent log-log graft paper; include selectable ranges for each type of overcurrent protective device.
  10. Include diagram and details of proposed mimic bus.
  11. Include schematic and wiring diagrams for power, signal, and control wiring.



- C. Samples: Representative portion of mimic bus with specified material and finish, for color selection.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Seismic Qualification Certificates: For switchboards, overcurrent protective devices, accessories, and components, from manufacturer.
  - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
  - 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
  - 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- B. Field Quality-Control Reports:
  - 1. Test procedures used.
  - 2. Test results that comply with requirements.
  - 3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For switchboards and components to include in emergency, operation, and maintenance manuals.
  - 1. Include the following, at a minimum:
    - a. Product name and model number. Use designations for products indicated on Contract Documents.
    - b. Manufacturer's name.
    - c. Equipment identification with serial number of each component.
    - d. Equipment function.
    - e. Operating characteristics.
    - f. Limiting conditions.
    - g. Performance curves.
    - h. Engineering data and tests.
    - i. Complete nomenclature and number of replacement parts.
    - j. Routine maintenance requirements for switchboards and all installed components.
    - k. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
    - l. Time-current coordination curves for each type and rating of overcurrent protective device included in switchboards. Submit on translucent log-log graph paper; include selectable ranges for each type of overcurrent protective device.

#### 1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Potential Transformer Fuses: Equal to 10 percent of quantity installed for each size and type but no fewer than two of each size and type.

2. Control-Power Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than two of each size and type.

#### 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers qualified as defined in NEMA PB 2.1 and trained in electrical safety as required by NFPA 70E.
- B. Testing Agency Qualifications: Member company of NETA or an NRTL.
  1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver switchboards in sections or lengths that can be moved past obstructions in delivery path.
- B. Remove loose packing and flammable materials from inside switchboards and connect factory-installed space heaters to temporary electrical service to prevent condensation.
- C. Handle and prepare switchboards for installation according to NECA 400.

#### 1.9 FIELD CONDITIONS

- A. Installation Pathway: Remove and replace access fencing, doors, lift-out panels, and structures to provide pathway for moving switchboards into place.
- B. Environmental Limitations:
  1. Rate equipment for continuous operation under the following conditions unless otherwise indicated:
    - a. Ambient Temperature: Not exceeding 104 deg F.
    - b. Altitude: Not exceeding 6600 feet.
- C. Unusual Service Conditions:
  1. Exposure to salty air.
- D. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
  1. Notify Construction Manager no fewer than seven days in advance of proposed interruption of electric service.
  2. Indicate method of providing temporary electric service.
  3. Do not proceed with interruption of electric service without Construction Manager's written permission.
  4. Comply with NFPA 70E.

## 1.10 COORDINATION

- A. Coordinate layout and installation of switchboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- B. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified with concrete.

## 1.11 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace switchboard enclosures, buswork, overcurrent protective devices, accessories, and factory installed interconnection wiring that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: Three years from date of Substantial Completion.
- B. Manufacturer's Warranty: Manufacturer's agrees to repair or replace surge protection devices that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: Five years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Switchboards shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
  - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation. Shake-table testing shall comply with ICC-ES AC156.
  - 2. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified.

### 2.2 SWITCHBOARDS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- B. Product by one of the following:
  - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
  - 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
  - 3. Siemens Energy & Automation, Inc.
  - 4. Square D; a brand of Schneider Electric.
  - 5. Myers Power Products.
  - 6. Or approved equal.

- C. Source Limitations: Obtain switchboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.
- D. Product Selection for Restricted Space: Drawings indicate maximum dimensions for switchboards including clearances between switchboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- F. Comply with NEMA PB 2.
- G. Comply with NFPA 70.
- H. Comply with UL 891.
- I. Front-Connected, Front-Accessible Switchboards:
  - 1. Main Devices: Fixed, individually mounted.
  - 2. Branch Devices: Panel mounted.
  - 3. Sections front and rear aligned.
- J. Nominal System Voltage: 480Y/277 V.
- K. Main-Bus Continuous: As shown.
- L. Enclosures: Type 1.
  - 1. Finish: Factory-applied finish in manufacturer's standard color; undersurfaces treated with corrosion-resistant undercoating.
- M. Weather Shelter:
  - 1. Provide walk in type weather shelter to house switchboard. Shelter shall be suitable for the project location's structural loading criteria as shown on Drawing S0.0.
  - 2. The shelter shall be sized to house the switchboard and all required accessories and provide NEC required minimum working clearances.
  - 3. The shelter shall be equipped with two outward swinging doors equipped with panic hardware and re-keyable locks.
  - 4. The shelter shall be equipped with LED interior lighting and thermostatically controlled electric heaters.
- N. Barriers: Between adjacent switchboard sections.
- O. Insulation and isolation for main bus of main section and main and vertical buses of feeder sections.
- P. Space Heaters: Factory-installed electric space heaters of sufficient wattage in each vertical section to maintain enclosure temperature above expected dew point.
  - 1. Space-Heater Control: Thermostats to maintain temperature of each section above expected dew point.
  - 2. Space-Heater Power Source: Transformer, factory installed in switchboard.

- Q. Service Entrance Rating: Switchboards intended for use as service entrance equipment shall contain from one to six service disconnecting means with overcurrent protection, a neutral bus with disconnecting link, a grounding electrode conductor terminal, and a main bonding jumper.
- R. Customer Metering Compartment: A separate customer metering compartment for indicated metering, and current transformers for each meter. Current transformer secondary wiring shall be terminated on shorting-type terminal blocks.
- S. Bus Transition and Incoming Pull Sections: Matched and aligned with basic switchboard.
- T. Removable, Hinged Rear Doors and Compartment Covers: Secured by standard bolts, for access to rear interior of switchboard.
- U. Hinged Front Panels: Allow access to circuit breaker, metering, accessory, and blank compartments.
- V. Buses and Connections: Three phase, four wire.
  - 1. Provide phase bus arrangement A, B, C from front to back, top to bottom, and left to right when viewed from the front of the switchboard.
  - 2. Phase- and Neutral-Bus Material: Hard-drawn copper of 98 percent conductivity
  - 3. Copper feeder circuit-breaker line connections.
  - 4. Load Terminals: Insulated, rigidly braced, runback bus extensions, of same material as through buses, equipped with compression connectors for outgoing circuit conductors. Provide load terminals for future circuit-breaker positions at full-ampere rating of circuit-breaker position.
  - 5. Ground Bus: Minimum-size required by UL 891, hard-drawn copper of 98 percent conductivity, equipped with compression connectors for feeder and branch-circuit ground conductors.
  - 6. Main-Phase Buses and Equipment-Ground Buses: Uniform capacity for entire length of switchboard's main and distribution sections. Provide for future extensions from both ends.
  - 7. Disconnect Links:
    - a. Bond neutral bus to equipment-ground bus for switchboards utilized as service equipment or separately derived systems.
  - 8. Neutral Buses: 100 percent of the ampacity of phase buses unless otherwise indicated, equipped with compression connectors for outgoing circuit neutral cables. Brace bus extensions for busway feeder neutral bus.
- W. Future Devices: Equip compartments with mounting brackets, supports, bus connections, and appurtenances at full rating of circuit-breaker compartment.
- X. Bus-Bar Insulation: Factory-applied, flame-retardant, tape wrapping of individual bus bars or flame-retardant, spray-applied insulation. Minimum insulation temperature rating of 105 deg C.

## 2.3 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- A. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with interrupting capacity to meet available fault currents.

1. Electronic trip circuit breakers with rms sensing; field-replaceable rating plug or field-replicable electronic trip; and the following field-adjustable settings:
  - a. Instantaneous trip.
  - b. Long- and short-time pickup levels.
  - c. Long and short time adjustments.
  - d. Ground-fault pickup level, time delay, and  $I^2t$  response.
2. MCCB Features and Accessories:
  - a. Standard frame sizes, trip ratings, and number of poles.
  - b. Lugs: Compression style, suitable for number, size, trip ratings, and conductor material.
  - c. Ground-Fault Protection: Integrally or Remote-mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
  - d. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage without intentional time delay.
3. Arc Energy Reduction: Circuit breakers rated 1200A or high shall be equipped with an arc energy reducing maintenance switch with local status indicator.

## 2.4 INSTRUMENTATION

- A. Instrument Transformers: NEMA EI 21.1, and the following:
  1. Potential Transformers: NEMA EI 21.1; 120 V, 60 Hz secondary; disconnecting type with integral fuse mountings. Burden and accuracy shall be consistent with connected metering and relay devices.
  2. Current Transformers: NEMA EI 21.1; 5 A, 60 Hz, secondary; bar or window type; secondary winding and secondary shorting device. Burden and accuracy shall be consistent with connected metering and relay devices.
  3. Control-Power Transformers: Dry type, mounted in separate compartments for units larger than 3 kVA.
  4. Current Transformers for Neutral and Ground-Fault Current Sensing: Connect secondary wiring to ground overcurrent relays, via shorting terminals, to provide selective tripping of main and tie circuit breaker. Coordinate with feeder circuit-breaker, ground-fault protection.
- B. Multifunction Digital-Metering Monitor: Microprocessor-based unit suitable for three- or four-wire systems and with the following features:
  1. Switch-selectable digital display of the following values with maximum accuracy tolerances as indicated:
    - a. Phase Currents, Each Phase: Plus or minus 0.5 percent.
    - b. Phase-to-Phase Voltages, Three Phase: Plus or minus 0.5 percent.
    - c. Phase-to-Neutral Voltages, Three Phase: Plus or minus 0.5 percent.
    - d. Megawatts: Plus or minus 1 percent.
    - e. Megavars: Plus or minus 1 percent.
    - f. Power Factor: Plus or minus 1 percent.
    - g. Frequency: Plus or minus 0.1 percent.
    - h. Accumulated Energy, Megawatt Hours: Plus or minus 1 percent; accumulated values unaffected by power outages up to 72 hours.
    - i. Megawatt Demand: Plus or minus 1 percent; demand interval programmable from five to 60 minutes.
    - j. Contact devices to operate remote impulse-totalizing demand meter.

2. Mounting: Display and control unit flush or semiflush mounted in instrument compartment door.
3. Connect meter to monitor incoming feeder and each branch circuit.

## 2.5 ACCESSORY COMPONENTS AND FEATURES

- A. Accessory Set: Include tools and miscellaneous items required for overcurrent protective device test, inspection, maintenance, and operation.
- B. Portable Test Set: For testing functions of solid-state trip devices without removing from switchboard. Include relay and meter test plugs suitable for testing switchboard meters and switchboard class relays.
- C. Mounting Accessories: For anchors, mounting channels, bolts, washers, and other mounting accessories, comply with requirements in Section 260548.16 "Seismic Controls for Electrical Systems" or manufacturer's instructions.

## 2.6 IDENTIFICATION

- A. Service Equipment Label: NRTL labeled for use as service equipment for switchboards with one or more service disconnecting and overcurrent protective devices.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Receive, inspect, handle, and store switchboards according to NECA 400.
  1. Lift or move panelboards with spreader bars and manufacturer-supplied lifting straps following manufacturer's instructions.
  2. Use rollers, slings, or other manufacturer-approved methods if lifting straps are not furnished.
  3. Protect from moisture, dust, dirt, and debris during storage and installation.
  4. Install temporary heating during storage per manufacturer's instructions.
- B. Examine switchboards before installation. Reject switchboards that are moisture damaged or physically damaged.
- C. Examine elements and surfaces to receive switchboards for compliance with installation tolerances and other conditions affecting performance of the Work or that affect the performance of the equipment.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 INSTALLATION

- A. Install switchboards and accessories according to NECA 400.

- B. Equipment Mounting: Install switchboards and weather shelter on a structural concrete pad that has been designed to withstand the structural loading criteria listed on Drawing S0.0.
  - 1. Install conduits entering underneath the switchboard, entering under the vertical section where the conductors will terminate. Install with couplings flush with the concrete base. Extend 2 inches (50-mm) above concrete base after switchboard is anchored in place.
  - 2. For supported equipment, install stainless steel anchor bolts that extend through equipment and anchor into structural concrete pad. The anchor bolts are to be sized and embedded to withstand the structural loading criteria listed on Drawing S0.0.
  - 3. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - 4. Install anchor bolts to elevations required for proper attachment to switchboards.
- C. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, straps and brackets, and temporary blocking of moving parts from switchboard units and components.
- D. Operating Instructions: Frame and mount the printed basic operating instructions for switchboards, including control and key interlocking sequences and emergency procedures. Fabricate frame of finished wood or metal and cover instructions with clear acrylic plastic. Mount on front of switchboards.
- E. Install filler plates in unused spaces of panel-mounted sections.
- F. Install overcurrent protective devices, surge protection devices, and instrumentation.
  - 1. Set field-adjustable switches and circuit-breaker trip ranges.
- G. Install spare-fuse cabinet.
- H. Comply with NECA 1.

### 3.3 CONNECTIONS

- A. Bond conduits entering underneath the switchboard to the equipment ground bus with a bonding conductor sized per NFPA 70.
- B. Support and secure conductors within the switchboard according to NFPA 70.
- C. Extend insulated equipment grounding cable to busway ground connection and support cable at intervals in vertical run.

### 3.4 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- B. Switchboard Nameplates: Label each switchboard compartment with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."



- C. Device Nameplates: Label each disconnecting and overcurrent protective device and each meter and control device mounted in compartment doors with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

### 3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- C. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
  - 1. Acceptance Testing:
    - a. Test insulation resistance for each switchboard bus, component, connecting supply, feeder, and control circuit. Open control and metering circuits within the switchboard, and remove neutral connection to surge protection and other electronic devices prior to insulation test. Reconnect after test.
    - b. Test continuity of each circuit.
  - 2. Test ground-fault protection of equipment for service equipment per NFPA 70.
  - 3. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
  - 4. Correct malfunctioning units on-site where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
  - 5. Perform the following infrared scan tests and inspections, and prepare reports:
    - a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each switchboard. Remove front panels so joints and connections are accessible to portable scanner.
    - b. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each switchboard 11 months after date of Substantial Completion.
    - c. Instruments and Equipment:
      - 1) Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
  - 6. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Switchboard will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports, including a certified report that identifies switchboards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

### 3.6 ADJUSTING

- A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

- B. Set field-adjustable circuit-breaker trip ranges as indicated.

### 3.7 PROTECTION

- A. Temporary Heating: Apply temporary heat, to maintain temperature according to manufacturer's written instructions, until switchboard is ready to be energized and placed into service.

### 3.8 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain switchboards, over-current protective devices, instrumentation, and accessories, and to use and reprogram microprocessor-based trip, monitoring, and communication units.

END OF SECTION 26 24 13

## SECTION 26 28 16 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Molded-case circuit breakers (MCCBs).
  - 2. Enclosures.

#### 1.3 DEFINITIONS

- A. NC: Normally closed.
- B. NO: Normally open.
- C. SPDT: Single pole, double throw.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
  - 1. Enclosure types and details for types other than NEMA 250, Type 1.
  - 2. Current and voltage ratings.
  - 3. Short-circuit current ratings (interrupting and withstand, as appropriate).
  - 4. Include evidence of NRTL listing for series rating of installed devices.
  - 5. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.
  - 6. Include time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device.
- B. Shop Drawings: For enclosed switches and circuit breakers. Include plans, elevations, sections, details, and attachments to other work.
  - 1. Wiring Diagrams: For power, signal, and control wiring.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.

- B. Seismic Qualification Certificates: For enclosed switches and circuit breakers, accessories, and components, from manufacturer.
  - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
  - 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
  - 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- C. Field quality-control reports.
  - 1. Test procedures used.
  - 2. Test results that comply with requirements.
  - 3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.
- D. Manufacturer's field service report.

#### 1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For enclosed switches and circuit breakers to include in emergency, operation, and maintenance manuals. Include the following, at a minimum:
  - 1. Product name, make, and model number.
  - 2. Operating standards.
  - 3. Operating procedures.
  - 4. Precautions against improper use.
  - 5. Manufacturer's written instructions for testing and adjusting enclosed switches and circuit breakers.
  - 6. Time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device.

#### 1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.
  - 1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.
- B. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single source from single manufacturer.
- C. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- E. Comply with NFPA 70.

## 1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:
  - 1. Ambient Temperature: Not less than minus 22 deg F and not exceeding 104 deg F.
  - 2. Altitude: Not exceeding 6600 feet.
- B. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
  - 1. Notify Owner no fewer than seven days in advance of proposed interruption of electric service.
  - 2. Indicate method of providing temporary electric service.
  - 3. Do not proceed with interruption of electric service without Owner's written permission.
  - 4. Comply with NFPA 70E.

## 1.9 COORDINATION

- A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

## PART 2 - PRODUCTS

### 2.1 MOLDED-CASE CIRCUIT BREAKERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Eaton.
  - 2. General Electric.
  - 3. Siemens.
  - 4. Square D.
  - 5. Or approved equal.
- B. General Requirements: Comply with UL 489, NEMA AB 1, and NEMA AB 3, with interrupting capacity to comply with available fault currents.
- C. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
- D. Ground-Fault, Equipment-Protection (GFEP) Circuit Breakers: With Class B ground-fault protection (30-mA trip).
- E. Features and Accessories:
  - 1. Standard frame sizes, trip ratings, and number of poles.
  - 2. Lugs: Mechanical type, suitable for number, size, trip ratings, and conductor material.
  - 3. Application Listing: Appropriate for application.

4. Ground-Fault Protection: Comply with UL 1053; integrally mounted, self-powered type with mechanical ground-fault indicator; relay with adjustable pickup and time-delay settings, push-to-test feature, internal memory, and shunt trip unit; and three-phase, zero-sequence current transformer/sensor.
5. Arc Energy Reduction: Circuit breakers rated 1200A or high shall be equipped with an arc energy reducing maintenance switch with local status indicator.

## 2.2 ENCLOSURES

- A. Enclosed Switches and Circuit Breakers: NEMA AB 1, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.
  1. Outdoor Locations: NEMA 250, Type 4X.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.
- B. Comply with mounting and anchoring requirements specified in Section 260548.16 "Seismic Controls for Electrical Systems."
- C. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.
- D. Install fuses in fusible devices.
- E. Comply with NECA 1.

### 3.3 IDENTIFICATION

- A. Comply with requirements in Section 260553 "Identification for Electrical Systems."
  1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
  2. Label each enclosure with engraved metal or laminated-plastic nameplate.

### 3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections.
  - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- D. Acceptance Testing Preparation:
  - 1. Test insulation resistance for each enclosed switch and circuit breaker, component, connecting supply, feeder, and control circuit.
  - 2. Test continuity of each circuit.
- E. Tests and Inspections:
  - 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
  - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
  - 3. Perform the following infrared scan tests and inspections and prepare reports:
    - a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each enclosed switch and circuit breaker. Remove front panels so joints and connections are accessible to portable scanner.
    - b. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each enclosed switch and circuit breaker 11 months after date of Substantial Completion.
    - c. Instruments and Equipment: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
  - 4. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.
- F. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.
- G. Prepare test and inspection reports, including a certified report that identifies enclosed switches and circuit breakers and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

### 3.5 ADJUSTING

- A. Adjust moving parts and operable components to function smoothly and lubricate as recommended by manufacturer.

END OF SECTION 26 28 16

## SECTION 31 20 00 - EARTH MOVING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Excavating and backfilling for buildings and structures.
  - 2. Subbase course and base course for asphalt paving.
  - 3. Excavating and backfilling trenches for utilities and pits for buried utility structures.

#### 1.3 DEFINITIONS

- A. Backfill: Soil material used to fill an excavation.
- B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving or Portland Cement Concrete.
- C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- E. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
- F. Fill: Soil materials used to raise existing grades.
- G. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- H. Structural Fill: Classified fill placed between the subgrade and aggregate base course for hot-mix asphalt pavement or between subgrade and Portland cement concrete.
- I. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
- J. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.



- K. Unclassified Material: Non-organic in situ materials excavated from the site that are free of muck, peat, roots, sod, or other deleterious matter.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of the following products:
  - 1. Warning tape.
  - 2. Gradation test reports and compaction curves (ASTM D 1557) for structural fill, bedding, and base course grading D-1.

#### 1.5 FIELD CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth-moving operations.
  - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
  - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B. Utility Locator Service: Notify utility locator service “Call Before You Dig” 811 prior to digging.
- C. Do not commence earth-moving operations until temporary best management practices, storm drain protection, and erosion and sedimentation-control measures are in place.

### PART 2 - PRODUCTS

#### 2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487, or a combination of these groups; free of rock larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487.
  - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Base Course: Graded mixture crushed gravel, crushed stone, and natural or crushed sand; meeting all requirements for Alaska DOT&PF grading, D-1, in section 703 of the Alaska DOT&PF Standard Specifications for Highway Construction 2017 Edition.

- E. Structural Fill: Naturally or artificially graded mixture of natural or crushed stone in accordance with Alaska DOT Standard Specifications for Highway Construction 2017, Section 703-2.13 and table 703-12.
- F. Bedding Material: Naturally or artificially graded mixture of gravel and sand, with 100 percent passing a 3/4-inch sieve and not more than 5 percent passing a No. 200 (0.075-mm) sieve.

## 2.2 ACCESSORIES

- A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored as follows:
  - 1. Red: Electric.
  - 2. Orange: Telephone and other communications.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.
- B. Protect and maintain erosion and sedimentation controls during earth-moving operations.
- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

### 3.2 DEWATERING

- A. Provide dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.
- B. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- C. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
  - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

- D. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others.

### 3.3 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
  - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

### 3.4 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch (25 mm). If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
  - 1. Excavation for Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch (25 mm). Do not disturb bottom of excavations intended as bearing surfaces.

### 3.5 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit unless otherwise indicated.
- C. Trench Bottoms: Excavate trenches 6 inches (150 mm) deeper than bottom of pipe and conduit elevations to allow for bedding course.

### 3.6 SUBGRADE INSPECTION

- A. Notify Owner when excavations have reached required subgrade.
- B. If Owner determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Owner, and replace with compacted backfill or fill as directed.
- D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Owner, without additional compensation.

### 3.7 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

### 3.8 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
  - 1. Surveying locations of underground utilities for Record Documents.
  - 2. Testing and inspecting underground utilities.
  - 3. Removing concrete formwork.
  - 4. Removing trash and debris.
  - 5. Removing temporary shoring, bracing, and sheeting.
  - 6. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.

### 3.9 UTILITY TRENCH BACKFILL

- A. Place backfill on subgrades free of mud, frost, snow, or ice.
- B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- C. Trenches under Footings: Backfill trenches excavated under footings and within 18 inches (450 mm) of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings.
- D. Carefully compact bedding under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
- E. Backfill voids with satisfactory soil while removing shoring and bracing.
- F. Controlled Low-Strength Material: Place initial backfill of controlled low-strength material to a height of 6 inches (150 mm) over the pipe or conduit. Coordinate backfilling with utilities testing.
- G. Warning Tape: Install warning tape directly above utilities, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

### 3.10 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
  - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
  - 2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

### 3.11 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 6 inches (150 mm) in loose depth for material compacted by heavy compaction equipment and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:
  - 1. For utility trenches, compact each layer of initial and final backfill soil material at 95 percent.
- D. Test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2937, and ASTM D 6938, as applicable. Testing frequency for compaction shall conform to the following locations and frequencies:
  - 1. Utility Systems Compaction Tests; The number of density tests required for backfill in utility trenches shall conform to the following:
    - a. Bedding layers: One test per 100 feet of trench or a minimum of two tests per trench, whichever is greater
    - b. When testing results show that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.
    - c. All test results shall be submitted to the Owner.

### 3.12 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
  - 1. Provide a smooth transition between adjacent existing grades and new grades.
  - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

### 3.13 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
  - 1. Scarify or remove and replace soil material to depth as directed by Owner; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
  - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

### 3.14 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.
- B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Owner.
  - 1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 31 20 00

## SECTION 32 12 16 - ASPHALT PAVING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Hot-mix asphalt patching.
  - 2. Hot-mix asphalt paving.
- B. Related Requirements:
  - 1. Section 312000 "Earth Moving" for subgrade preparation, fill material, separation geotextiles, unbound-aggregate subbase and base courses, and aggregate pavement shoulders.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include technical data and tested physical and performance properties.
  - 2. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.
  - 3. Job-Mix Designs: For each job mix proposed for the Work.

#### 1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by Alaska Department of Transportation & Public Facilities (DOT&PF).
- B. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of DOT&PF 2017 Standard Specifications for Highway Construction.
  - 1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

#### 1.5 FIELD CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:

1. Tack Coat: Minimum surface temperature of 40 deg F (4.4 deg C) and rising at time of placement.
2. Base Course: Minimum surface temperature of 40 deg F (4.4 deg C) and rising at time of placement.

PART 2 - PRODUCTS

2.1 AGGREGATES

- A. Course Aggregate: (retained on the No. 4 sieve). Crushed stone or crushed gravel consisting of sound, tough, durable rock of uniform quality. Free from clay balls, vegetative matter or other deleterious matters. Not coated with dirt or other finely divided mineral matter. Meet the following requirements:

PROPERTIES	TEST METHOD	
L.A. Wear, %	AASHTO T 96	45, max
Degradation Value	ATM 313	30, min
Sodium Sulfate Loss, %	AASHTO T 104	9, max (5cycles)
Fracture, %	WAQTC FOP for AASHTO TP 61	80, min (single face)
Flat-Elongated Pieces, %	ATM 306	8%, max

- B. Fine Aggregate: (passing the No. 4 sieve). Meet the quality requirements of AASHTO M 29, including S1.1, Sulfate Soundness.
- C. Blended Aggregate: Blend the aggregate fractions to meet the grading requirements of ADOT Specifications Table 703-3 (Type III gradation), as determined by WAQTC FOP for AASHTO T 27/T 11. Ensure that the fraction actually retained between any two consecutive sieves larger than the No. 100 sieve is not less than 2% of the total.



<b>Table 703-3 (ADOT 2004 Standard Specifications)</b>	
<b>BROAD BAND GRADATION FOR ASPHALT CONCRETE PAVEMENT AGGREGATE</b>	
<b>SIEVE</b>	<b>(Percent Passing by Weight-Type III)</b>
1/2 in	100
3/8 in	80-90
No. 4	44-81
No. 8	26-70
No. 16	16-59
No. 30	9-49
No. 50	6-36
No. 100	4-22
No. 200	3-7

2.2 ASPHALT MATERIALS

- A. Asphalt Binder: AASHTO M 320 PG58-28.
- B. Tack Coat: Meet requirements of ADOT Section 702-2.03 as follows; Special Tack Emulsion, STE-1. Meet AASHTO M 140 and the following, when tested using ASTM D 244.

TESTS ON EMULSION	
DESIGN PARAMETERS	
Viscosity @ 77 °F, SSF	30, max
Storage Stability, 1 day, %	1, max
Demulsibility, 35 mL 0.8% SDS, %	25, min
Particle Charge Positive*	
Sieve Test, % Retained	0.10, max
Distillation Oil by Vol of Emulsion, %	5, max
Distillation Residue by Wt of Emulsion, %	45, min

*\* If particle charge test is inconclusive, material having a max pH value of 6.7 is acceptable.*

TESTS ON RESIDUE	
DESIGN PARAMETERS	
Penetration @ 77 °F	100-200
Ductility @ 77 °F, 5 cm/min., cm	40, min
Solubility in TCE, %	97.5, min

### 2.3 AUXILIARY MATERIALS

- A. Pavement-Marking Paint: Low VOC Solvent Traffic and Parking Lot Paint manufactured by Ennis Paint Inc. or approved equal.
  - 1. Color: As indicated or match existing in areas of repair or remove or replacement of AC pavement or PC concrete.

### 2.4 MIXES

- A. The approved Job Mix Design will specify the target values for gradation, the target value for asphalt cement content, the Maximum Specific Gravity (MSG) of the mix, the additives and the allowable mixing temperature range. Target values for gradation in the Job Mix Design must be within the broad band limits shown in section 2.1.C, Table 703-3, for Type III asphalt. Do not produce asphalt concrete mixture for payment until the Owner approves the Job Mix.

B. Mix design shall meet the requirements of ADOT Specification Table 401-1 as follows:

<b>TABLE 401-1</b>	
ASPHALT CONCRETE MIX DESIGN REQUIREMENTS (CLASS B)	
DESIGN PARAMETERS	
Stability, pounds	1200 min
Flow, 0.01 inch	8-16
Voids in total mix, %	3-5
Compaction, number of blows each side of test specimen	50
Percent voids filled with asphalt (VFA)	65-78
Dust-asphalt ratio*	0.6-1.4
Voids in the mineral aggregate (VMA), %, min.	13.0 (TYPE III)

*\*Dust-asphalt ratio is the percent of material passing the No. 200 sieve divided by the percent of effective asphalt (calculated by weight of mix).*

**PART 3 - EXECUTION**

**3.1 PATCHING**

- A. Hot-Mix Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.
- B. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.05 to 0.15 gal/sq yd.
  - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
  - 2. Avoid smearing or staining adjoining surfaces, appurtenances and surroundings. Remove spillages and clean affected surfaces.
- C. Patching: Fill excavated pavements with hot-mix asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.

### 3.2 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
- B. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal/sq yd.
  - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
  - 2. Avoid smearing or staining adjoining surfaces, appurtenances and surroundings. Remove spillages and clean affected surfaces.

### 3.3 HOT-MIX ASPHALT PLACING

- A. Machine place hot-mix asphalt on prepared surface, spread uniformly and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section and thickness when compacted.
  - 1. Spread mix at minimum temperature of 250 deg F.
  - 2. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
- B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.
- C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

### 3.4 JOINTS

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.
  - 1. Clean contact surfaces and apply tack coat to joints.
  - 2. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either bulkhead or papered method according to AI MS-22, for both Ending a Lane and Resumption of Paving Operations.

### 3.5 COMPACTION

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
  - 1. Complete compaction before mix temperature cools to 185 deg F.
- B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated

crown, grade and smoothness. Correct laydown and rolling operations to comply with requirements.

- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
  - 1. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent nor greater than 96 percent.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
- F. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- G. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

### 3.6 INSTALLATION TOLERANCES

- A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
  - 1. Base Course: Plus or minus 1/2 inch.
  - 2. Surface Course: Plus 1/4 inch, no minus.
- B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 12-foot straightedge applied transversely or longitudinally to paved areas:
  - 1. Base Course: 1/4 inch.
  - 2. Surface Course: 1/8 inch.
  - 3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

### 3.7 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor will engage a qualified testing agency to perform tests and inspections.
- B. Replace and compact hot-mix asphalt where core tests were taken.
- C. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.8 DISPOSAL

- A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.

END OF SECTION 32 12 16

## SECTION 32 31 13 - CHAIN LINK FENCES AND GATES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Chain-link fences.
  - 2. Swing gates.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
    - a. Fence and gate posts, rails, and fittings.
    - b. Chain-link fabric, reinforcements, and attachments.
    - c. Gates and hardware.
- B. Shop Drawings: For each type of fence and gate assembly.
  - 1. Include plans, elevations, sections, details, and attachments to other work.
  - 2. Include accessories, hardware, gate operation, and operational clearances.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of chain-link fence and gate.
- B. Field quality-control reports.
- C. Sample Warranty: For special warranty.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For gate operators to include in emergency, operation, and maintenance manuals.

## 1.6 FIELD CONDITIONS

- A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

## 1.7 WARRANTY

- A. Special Warranty: Installer agrees to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Failure to comply with performance requirements.
    - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
  - 2. Warranty Period: Five years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer to design chain-link fence and gate frameworks.
- B. Structural Performance: Chain-link fence and gate frameworks shall withstand the design wind loads and stresses for fence height(s) and under exposure conditions indicated according to ASCE/SEI 7.
  - 1. Design Wind Load: per 2012 IBC.
    - a. Minimum Post Size: Determine according to ASTM F 1043 for post spacing not to exceed 8 feet for Material Group IA, ASTM F 1043, Schedule 40 steel pipe.

### 2.2 CHAIN-LINK FENCE FABRIC

- A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist according to "CLFMI Product Manual" and requirements indicated below:
  - 1. Fabric Height: 8 feet.
  - 2. Steel Wire for Fabric: Wire diameter of 9 gauge.
    - a. Mesh Size: 2 inches.
    - b. Zinc-Coated Fabric: ASTM A 392, Type II, Class 2, 2.0 oz./sq. ft.
    - c. Coat selvage ends of metallic-coated fabric before the weaving process with manufacturer's standard clear protective coating.



## 2.3 FENCE FRAMEWORK

- A. Posts and Rails ASTM F 1043 for framework, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F 1083 based on the following:
  - 1. Fence Height: 96 inches.
    - a. Line Post: 3.0 inches in diameter.
    - b. End, Corner, and Pull Posts: 4.0 inches.
  - 2. Horizontal Framework Members: top and bottom rails according to ASTM F 1043.
    - a. Type A: Not less than minimum 2.0-oz./sq. ft. average zinc coating according to ASTM A 123/A 123M< or 4.0-oz./sq. ft. zinc coating according to ASTM A 653/A 653M.
    - b. Type B: Zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. of zinc after welding, a chromate conversion coating, and a clear, verifiable polymer film.
    - c. External, Type B: Zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. of zinc after welding, a chromate conversion coating, and a clear, verifiable polymer film. Internal, Type D, consisting of 81 percent, not less than 0.3-mil- thick, zinc-pigmented coating.
    - d. Type C: Zn-5-Al-MM alloy, consisting of not less than 1.8-oz./sq. ft. coating.
    - e. Coatings: Any coating above.

## 2.4 SWING GATES

- A. General: ASTM F 900 for gate posts and single swing gate types.
  - 1. Gate Leaf Width: 48 inches.
  - 2. Framework Member Sizes and Strength: Based on gate fabric height 96 inches.
- B. Pipe and Tubing:
  - 1. Zinc-Coated Steel: ASTM F 1043 and ASTM F 1083; manufacturer's standard protective coating and finish.
- C. Frame Corner Construction: Welded.
- D. Hardware:
  - 1. Hinges: 180-degree outward swing.
  - 2. Latch: Permitting operation from both sides of gate with provision for padlocking and emergency push bar on inside.

## 2.5 FITTINGS

- A. Provide fittings according to ASTM F 626.
- B. Finish:
  - 1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz./sq. ft. of zinc.

## 2.6 GROUT AND ANCHORING CEMENT

- A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout, recommended in writing by manufacturer, for exterior applications.
- B. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating, and that is recommended in writing by manufacturer for exterior applications.

## 2.7 GROUNDING MATERIALS

- A. Comply with requirements in Section 260526 "Grounding and Bonding for Electrical Systems."
- B. Connectors and Grounding Rods: Listed and labeled for complying with UL 467.
  - 1. Connectors for Below-Grade Use: Exothermic welded type.
  - 2. Grounding Rods: Copper-clad steel, 3/4 by 120 inches.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.
  - 1. Do not begin installation before final grading is completed unless otherwise permitted by Owner.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Stake locations of fence lines, gates, and terminal posts. Indicate locations of utilities, underground structures, benchmarks, and property monuments.

### 3.3 CHAIN-LINK FENCE INSTALLATION

- A. Install chain-link fencing according to ASTM F 567 and more stringent requirements specified.
- B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.
- C. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.

1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
  2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
    - a. Exposed Concrete: Extend 2 inches above grade; shape and smooth to shed water.
    - b. Posts Set into Sleeves in Concrete: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout or anchoring cement, mixed and placed according to anchoring material manufacturer's written instructions. Finish anchorage joint to slope away from post to drain water.
- D. Terminal Posts: Install terminal end, corner, and gate posts according to ASTM F 567.
- E. Line Posts: Space line posts uniformly at 96 inches o.c.
- F. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.
  1. Locate horizontal braces at midheight of fabric 72 inches or higher, on fences with top rail, and at two-third fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.
- G. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.
- H. Intermediate and Bottom Rails: Secure to posts with fittings.
- I. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 2-inch bottom clearance between finish grade or surface and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.
- J. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts, with tension bands spaced not more than 15 inches o.c.
- K. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric according to ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.
  1. Maximum Spacing: Tie fabric to line posts at 12 inches o.c. and to braces at 24 inches o.c.
- L. Fasteners: Install nuts for tension bands and carriage bolts on the side of fence opposite the fabric side.

### 3.4 GATE INSTALLATION

- A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation.

### 3.5 GROUNDING AND BONDING

- A. Comply with requirements in Section 260526 "Grounding and Bonding for Electrical Systems."
- B. Fences Enclosing Electrical Power Distribution Equipment: Ground according to IEEE C2 unless otherwise indicated.
- C. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6 inches below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at grounding location.
- D. Connections:
  - 1. Make connections with clean, bare metal at points of contact.
  - 2. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
  - 3. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.
  - 4. Make above-grade ground connections with mechanical fasteners.
  - 5. Make below-grade ground connections with exothermic welds.
  - 6. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

### 3.6 ADJUSTING

- A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

END OF SECTION 32 31 13