



**Ted Stevens**  
**Anchorage**  
**International Airport**

PROJECT MANUAL FOR:

**ANC Access Control System Replacement**

**Project No. AIP 3-02-0016-XXX-2008/58300**

**AS-ADVERTISED: January 4, 2008**  
**DOCUMENT FEE: \$ 100.00**

**State of Alaska**  
**Department of Transportation and Public Facilities**  
**Central Region**  
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**STATE OF ALASKA**  
**OFFICE OF THE GOVERNOR**  
**JUNEAU**

January 18, 2007

Dear Prospective Contractor:

If you are considering a bid on an Alaska public works project, please remember the positive benefits of hiring locally. Construction, maintenance, and operation of public works projects are vital to the economic health of Alaska, and good paying jobs associated with such projects are especially important to Alaskans in rural areas of the state. As you are aware, people who live in rural Alaska do not have the same economic opportunities as those who live in urban areas. Jobs are especially critical in these communities.

Let me encourage you to pay particular attention to employment and training opportunities for local residents in villages and communities in the vicinity of the project(s). To make sure state government is doing its part, I have instructed state agencies to maximize the use of local labor sources on projects in these economically-distressed areas. The Alaska Departments of Transportation and Public Facilities, Labor and Workforce Development, the Alaska Job Center Network, and regional Native Coalition on Employment and Training offices are all helping to coordinate the state's efforts to maximize local hire through training and apprenticeship programs.

Another advantage to hiring locally is that hiring job-ready welfare recipients and the unemployed in their own communities earns you tax credits. The Work Opportunity Tax Credit (WOTC) program is a surefire boost to local hire efforts in rural Alaska. For more information on the tax credit program, contact your nearest Alaska Job Center office at (907) 465-5955, or visit our website at <http://www.jobs.state.ak.us/wotc.htm>.

The State of Alaska can assist in connecting you with skilled workers close to your worksite. If you are awarded a contract, we will send you additional information on the business benefits of hiring locally through the WOTC program. If there is anything we can do to assist you in this important effort, please let us know.

Your effort to hire locally is a show of good faith between your company and the community, and I am sure you will find the benefits are well worth the effort. Good luck in the upcoming construction season, and thank you for putting Alaskans to work.

Sincerely,

A handwritten signature in dark ink, appearing to read "Sarah Palin", with a large, stylized flourish at the end.

Sarah Palin  
Governor



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State wage rates can be obtained at <a href="http://www.labor.state.ak.us/lss/pamp600.htm">http://www.labor.state.ak.us/lss/pamp600.htm</a> . Use the State wage rates that are in effect 10 days before Bid Opening. The Department will include a paper copy of the State wage rates in the signed Contract.		

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Federal wage rates can be obtained at <a href="http://www.wdol.gov/dba.aspx#0">http://www.wdol.gov/dba.aspx#0</a> for the State of Alaska. Use the federal wage rates that are in effect 10 days before Bid Opening. The Department will include a paper copy of the federal wage rates in the signed Contract.		

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STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

**INVITATION FOR BIDS**  
for Construction Contract

Date January 4, 2008

**ANC Access Control System Replacement**  
**Project No. AIP 3-02-0016-XXX-2008/58300**

Location of Project: Anchorage, Alaska  
Contracting Officer: Steven R. Horn, P. E., Director of Construction and Operations  
Issuing Office: Central Region  
State Funded [ ☐ ] Federal Aid [ ☒ ]

Description of Work: This federally funded project includes the replacement of the existing Access Control System campus wide, including some new portals and other ancillary work. There is one additive alternate.

The Engineer's Estimate is between **\$ 5,000,000 and \$10,000,000.**  
All work shall be completed **by October 24, 2009**  
Interim Completion dates, if applicable, will be as shown in Section 01015.

**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 main conference room, 4111 Aviation Avenue, Anchorage, Alaska on January 30, 2008.**

**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:

**Bid for Project: ANC Access Control System Replacement**

**Project No. AIP 3-02-0016-XXX-2008/58300**

**ATTN: Contracts  
State of Alaska  
Department of Transportation & Public Facilities  
P.O. Box 196900  
Anchorage, AK 99519-6900**

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 **Sharon L. Smith P.E., Chief of Contracts** at the Contracts Section, 4111 Aviation Avenue, prior to the scheduled time of bid opening. Faxed bid amendments must be addressed to **Sharon L. Smith, P.E., Chief of Contracts.** Fax number: (907) 269-0425.

*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 Department 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.**

Contractors are advised that the award of some Pay Items under this contract is contingent upon receipt of legislative authority and federal funding. See Section 00312.

Plans and Specifications may be ordered, for the price of **\$100.00** from:

**State of Alaska, Department of Transportation & Public Facilities  
Plans Room  
4111 Aviation Avenue  
P.O. Box 196900  
Anchorage, AK 99519-6900**

Phone: (907) 269-0408

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:

**Jesse Campbell, P.E.**

Fax: (907) 266-2177

Phone: (907) 266-2723

All questions concerning bidding procedures should be directed to:

**Sharon L. Smith, P.E.  
Chief of Contracts  
P.O. Box 196900  
Anchorage, AK 99519-6900**

Phone: (907) 269-0414

**The Bid Calendar, Planholder lists, Bid Results and DBE information are available on the Internet at: [www.dot.state.ak.us](http://www.dot.state.ak.us) under Procurement. Sorry – we no longer fax planholder lists.**

This project was designed in the US customary (USC) units. Inspection will take place in USC units. Submittals must be provided in USC units.

To report bid rigging activities call: 1-800-424-9071.

The U.S. Department of Transportation (DOT) operates the above toll-free “hotline” Monday through Friday, 8:00 a.m. to 5:00 p.m., eastern time. Anyone with knowledge of possible rigging, bidder collusion, or other fraudulent activities should use the “hotline” to report such activities.

The “hotline” is part of the DOT’s continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

## **Special Notice to Bidders**

1. Based on guidance from the US Department of Transportation's General Counsel, effective January 10, 2006 the Alaska Department of Transportation and Public Facilities implemented a Race Neutral Disadvantaged Business Enterprise (DBE) program by setting 0% project goals on all highway, mass transit and airport projects. All forms and reports required under the existing DBE program will continue to be required under these 0% goal contracts.

Specifically, contractors must continue to report creditable DBE participation/payments on the Monthly Summary of Disadvantaged Business Enterprise Participation Form 25A-336. This will allow the Department to continue to accurately report DBE participation to the Federal Highway Administration, Federal Transit Administration and Federal Aviation Administration.

Contractors must also continue to provide opportunities for DBE firms to participate on highway, mass transit and airport projects as appropriate. A 0% DBE participation goal does not relieve the contractor of the requirement to provide equal opportunity in subcontracting, supplies or other services offered by DBE firms.

Any questions about this notice may directed to Jon Dunham, Manager of the Civil Rights Office, 907 269 0850, [jon.dunham@alaska.gov](mailto:jon.dunham@alaska.gov)

2. Bidders are hereby notified that data to assist in preparing bids is available as follows.
  - a) Exhibit A – Swanson General ACS drawings
  - b) Exhibit B – South Terminal Concourse C – Security System
  - c) Exhibit C – Field Maintenance Facility Access Control System
  - d) Exhibit D – Telecom & Special Systems – Phase 2
  - e) Exhibit E – Drawings showing ANC campus RCP
  - f) Exhibit F – ACS Door Photos

These Exhibits are available on CD from the DOT & PF Plans Room 269-0408.

**STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES  
INFORMATION TO BIDDERS**

The Department 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 visit the site 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 State of Alaska. The amount of the bid security is specified on the Invitation for Bids.

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 Department 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 Department 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 contemplated work.

## **SUBMISSION OF BIDS**

Bids must be submitted as directed on the Invitation for Bids. 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 Department 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 For Bids. 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 for Bids.

## **WITHDRAWAL OR REVISION OF BIDS**

A bidder may withdraw or revise a bid after it has been deposited with the Department, 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.

Telegraphic 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 Department 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 Department 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 Department for the premature opening of, or failure to open, a bid improperly addressed or identified.
- (c) The Department 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 Department 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 Department'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 Department 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.



**STATE OF ALASKA**  
**DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES**  
**SUPPLEMENTARY INFORMATION TO BIDDERS**

This document modifies or adds to the provisions of Department of Transportation and Public Facilities form 25D-3, INFORMATION TO BIDDERS.

Following subparagraph (c) under subject area "PREPARATION OF BIDS", add the following subparagraph:

"(C-1) When provided within the supplements to the bid schedule the Bidder shall specify those Alaska bidder and product preferences applicable to their bid. All entries made by the Bidder and designating applicable preferences must conform to the requirements of AS 36.30 and the instructions on the forms to warrant consideration."

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 DEPARTMENT by telephone and 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 DEPARTMENT's intent to Award the Contract and the successful Bidder will be requested to execute certain documents, including the Contract form and bonds."



STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

## REQUIRED DOCUMENTS

Federal-Aid Contracts

**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)**

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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)**

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**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 (25D-8)**
5. **Certificate of Insurance** (from carrier)
6. **EEO-1 Certification (Form 25A-304)**
7. **DBE Utilization Report (Form 25A-325C)**
8. When Form 25A-325C indicates less than the stated goal for the project, the successful bidder shall submit documentation of efforts in meeting the goal by submitting the following:  
**Summary of Good Faith Effort Documentation (Form 25A-332A), and**  
**Contact Reports (Form 25A-321A), as required**
9. On projects that include bid item 645, Training Program, the successful bidder shall submit the following:  
**Training Utilization Report (Form 25A-311), and/or**  
**DOT&PF Training Program Request (Form 25A-310), if required**
10. On Federal-aid highway projects: **Material Origin Certificate (Form 25D-60)**
11. On Federal-aid airport projects: **Buy American Certificate (Form 25D-61)**
12. Bidders must register annually with the Civil Rights Office in order to be eligible for award. If not registered, or if unsure, submit the following: **Bidder Registration (Form 25D-6)**
13. For each DBE to be used on the project, submit a **DBE Commitment (Form 25A-326)**

**SECTION 00120**  
**DISADVANTAGED BUSINESS ENTERPRISE (DBE) PROGRAM**  
**(Federal-Aid Contracts)**

**120-1.1 DESCRIPTION.** The work consists of providing Disadvantaged Business Enterprises (DBEs), as defined in Title 49, CFR (Code of Federal Regulations), Part 26, with the opportunity to participate on an equitable basis with other contractors in the performance of contracts financed in whole, or in part, with funding through the United States Department of Transportation (USDOT). 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 USDOT-assisted contracts.

**120-1.2 INTERPRETATION.** It is the intent of this section to implement the requirements of 49 CFR, Part 26, and the Department's federally approved DBE Program.

**120-1.3 ESSENTIAL CONTRACT PROVISION.** Failure to comply with the provisions of this section will be considered a material breach of contract, which may result in the termination of this contract or such other remedy, as the Department deems appropriate. The Department also considers failure to comply with this section to be so serious as to justify debarment action as provided in AS 36.30.640(4).

**120-1.4 DEFINITIONS AND TERMS.** The following definitions will apply.

- a. **Broker.** A DBE certified by the Department that arranges for the delivery or provision of creditable materials, supplies, equipment, transportation/hauling, insurance, bonding, etc., within its certified category, that is necessary for the completion of the project. A broker of materials certified in a supply category must be responsible for scheduling the delivery of materials and fully responsible for ensuring that the materials meet specifications before credit will be given.
- b. **Commercially Useful Function (CUF).** The execution of the work of the Contract by a DBE carrying out its responsibilities by actually performing, managing, and supervising the work involved using its own employees and equipment. The DBE shall be responsible, with respect to materials and supplies used on the Contract, for negotiating price, determining quality and quantity, ordering the material, and installing (where applicable) and paying for the material itself. To determine whether a DBE is performing a commercially useful function, an evaluation of the amount of work subcontracted, industry practices, whether the amount the firm is to be paid under the Contract is commensurate with the work it is actually performing and the DBE credit claimed for its performance of the work. Other relevant factors will be considered. The determination of CUF is made by the Engineer after evaluating the way in which the work was performed during the execution of the Contract.
- c. **Disadvantaged Business Enterprise (DBE).** An enterprise which is a for-profit small business concern
  - (1) that is at least 51 percent owned by one or more individuals who are both socially and economically disadvantaged or, in the case of a corporation, in which 51 percent of the stock is owned by one or more such individuals;
  - (2) whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who own it; and
  - (3) has been certified by the Department in accordance with 49 CFR, Part 26.
- d. **DBE Key Employee.** Permanent employees identified by the DBE owner in its certification file in the Department's Civil Rights Office (CRO).

- e. **DBE Utilization Goal.** The percent of work to be performed by certified DBEs that is established by the Department and specified in the Contract.
- f. **Good Faith Efforts.** Efforts by the bidder or Contractor to achieve a DBE goal or other requirement of 49 CFR Part 26, by their scope, intensity, and appropriateness to the objective, that can reasonably be expected to fulfill the program requirement.
- g. **Manufacturer.** A DBE certified by the Department in a supply category that changes the shape, form, or composition of original material in some way and then provides that altered material to the project and to the general public or the construction industry at large on a regular basis.
- h. **Notification.** For purposes of soliciting DBE participation on a project and to count toward a contractor's Good Faith Efforts, notification shall be by letter or fax transmission, with a return receipt requested or successful transmission report. Telephonic contact with a DBE may be allowed, however it shall be based on the ability of the CRO to independently verify this contact.
- i. **Regular Dealer.** A DBE certified by the Department in a supply category that
  - (1) maintains an in-house inventory on a regular basis of the particular product provided to this project; and
  - (2) keeps an inventory in an amount appropriate for the type of work using that product; and
  - (3) offers that inventory for sale to the general public or construction industry at large (private and public sectors), not just supplied as needed on a project by project basis during the construction season, except where the product requires special or heavy equipment for delivery and the DBE possesses and operates this equipment on a regular basis throughout the construction season in order to deliver the product to the general public or construction industry at large. If the distribution equipment is rented or leased, it must be on a repetitive, seasonal basis; and may additionally
  - (4) fabricate (assembles large components) for use on a construction project, consistent with standard industry practice, for delivery to the project.

**120-2.1 UTILIZATION GOAL.** The DBE Utilization Goal for this contract is shown on Form 25A-324 (DBE Subcontractable Items) as a percentage of the total basic bid amount. A DBE may be considered creditable towards meeting the DBE Utilization Goal at time of Contract award, if the DBE is certified by the Department in a category covering the CUF to be performed at the time of listing on Form 25A-325C (DBE Utilization Report).

A bidder shall demonstrate the ability to meet the DBE Utilization Goal or perform and document all of the required Good Faith Efforts under Subsection 120-3.2 in order to be eligible for award of this Contract.

If the quantity of work of a bid item involving a DBE firm is reduced by the Department, the DBE Utilization Goal on Form 25A-325C will be reduced proportionately.

### **120-3.1 DETERMINATION OF COMPLIANCE.**

- a. **Phase I - Bid.** Each bidder must register with the CRO annually in accordance with §§26.11 & 26.53(b)(2)(iv) of 49 CFR, Part 26. Use Form 25D-6. No contract may be awarded to a bidder that has not registered.
- b. **Phase II - Award.** The apparent low bidder will provide the following within 15 days of receipt of notice of intent to award:

- (1) **Written DBE Commitment.** Written commitments from DBEs to be used on the project. The written commitment shall contain the following information:
  - (a) A description of the work that each DBE will perform;
  - (b) The dollar amount of participation by the DBE firm;
  - (c) Written documentation of the bidder/offeror's commitment to use a DBE subcontractor whose participation it submits to meet a contract goal; and
  - (d) Written confirmation from the DBE that it is participating in the contract as provided in the prime Contractor's commitment.
- (2) **DBE Utilization Report.** Form 25A-325C listing the certified DBEs to be used to meet the DBE Utilization Goal.
- (3) **Good Faith Effort Documentation.** Summary of Good Faith Effort Documentation (Form 25A-332A and attachments) and DBE Contact Reports (Form 25A-321A) if the Contractor submits less DBE utilization on Form 25A-325C than is required to meet the DBE Utilization Goal. If accepted by the Department, this lower DBE utilization becomes the new DBE Utilization Goal. If the bidder cannot demonstrate the ability to meet the DBE Utilization Goal, and can not document the minimum required Good Faith Efforts (as outlined in Subsection 120-3.2 below), the Contracting Officer will determine the bidder to be not responsible.

**c. Phase III - Construction.**

- (1) **Designation of DBE/EEO Officer.** At the preconstruction conference, the Contractor shall submit, in writing, the designation of a DBE/EEO officer.
- (2) **DBE Creditable Work.** The CUF work items and creditable dollar amounts shown for a DBE on the DBE Utilization Report (Form 25A-325C) shall be included in any subcontract, purchase order or service agreement with that DBE.
- (3) **DBE Replacement.** If a DBE replacement is approved by the Engineer, the Contractor shall replace the DBE with another DBE for the same work in order to fulfill its commitment under the DBE Utilization Goal. In the event that the Contractor cannot obtain replacement DBE participation, the Engineer may adjust the DBE Utilization Goal if, in the opinion of the Engineer and the CRO, both of the following criteria have been met:
  - (a) The Contractor has not committed any discriminatory practice in its exercise of good business judgment to replace a DBE.
  - (b) If the Contractor is unable to find replacement DBE participation and has adequately performed and documented the Good Faith Effort expended in accordance with Subsection 120-3.2.
- (4) **DBE Utilization Goal.** The DBE Utilization Goal will be adjusted to reflect only that amount of the DBE's work that cannot be replaced.

**120-3.2 GOOD FAITH EFFORT.**

- a. **Good Faith Effort Criteria.** The Contracting Officer will use the following criteria to judge if the bidder, who has not met the DBE Utilization Goal, has demonstrated sufficient Good Faith Effort to be eligible for award of the contract.

Failure by the bidder to perform and document all of the following actions constitutes insufficient Good Faith Effort.

- (1) Consideration of all subcontractable items. The bidder shall, at a minimum, seek DBE participation for each of the subcontractable items upon which the DBE goal was established as identified by the Department (on Form 25A-324) prior to bid opening. It is the bidder's responsibility to make the work listed on the subcontractable items list available to DBE firms, to facilitate DBE participation.
  - (2) If the bidder cannot achieve the DBE Utilization Goal using the list of available DBE firms based on the subcontractable items list, then the bidder may consider other items that could be subcontracted to DBEs.
  - (3) Notification to all active DBEs listed for a given region in the Department's most current *DBE Directory* at least 7 calendar days prior to bid opening. The bidder must give the DBEs no less than five days to respond. The bidder may reject DBE quotes received after the deadline. Such a deadline for bid submission by DBEs will be consistently applied. DBEs certified to perform work items identified on Form 25A-324 must be contacted to solicit their interest in participating in the execution of work with the Contractor. Each contact with a DBE firm will be logged on a Contact Report (Form 25A-321A).
  - (4) Non-competitive DBE quotes may be rejected by the bidder. Allegations of non-competitive DBE quotes must be documented and verifiable. A DBE quote that is more than 10.0% higher than the accepted non-DBE quote will be deemed non-competitive, provided the DBE and non-DBE subcontractor quotes are for the exact same work or service. Bidders must have a non-DBE subcontractor quote for comparison purposes. Such evidence shall be provided in support of the bidder's allegation. Where the bidder rejects a DBE quote as being non-competitive under this condition, the work must be performed by the non-DBE subcontractor and payments received by the non-DBE subcontractor during the execution of the Contract shall be consistent with the non-DBE's accepted quote. This does not preclude increases as a result of Change documents issued by the Department.
  - (5) Provision of assistance to DBEs who need help in obtaining information about bonding or insurance required by the bidder.
  - (6) Provision of assistance to DBEs who need help in obtaining information about securing equipment, supplies, materials, or related assistance or services.
  - (7) Providing prospective DBEs with adequate information about the requirements of the Contract regarding the specific item of work or service sought from the DBE.
  - (8) Follow-up of initial notifications by contacting DBEs to determine whether or not they will be bidding. Failure to submit a bid by the project bid opening or deadline by the bidder is de facto evidence of the DBE's lack of interest in bidding. Documentation of follow-up contacts shall be logged on the Contact Report (Form 25A-321A).
  - (9) Items (3) through (8) will be utilized to evaluate any request from the Contractor for a reduction in the DBE Utilization Goal due to the default or decertification of a DBE and the Contractor's subsequent inability to obtain additional DBE participation.
- b. **Administrative Reconsideration.** Under the provisions of 49 CFR, Part 26.53(d), if it is determined that the apparent successful bidder has failed to meet the requirements of this subsection, the bidder must indicate whether they would like an opportunity for administrative reconsideration. Such an opportunity must be exercised by the bidder within 3 calendar days of notification it has failed to meet the requirements of this subsection. As part of this reconsideration, the bidder must provide

written documentation or argument concerning the issue of whether it met the goal or made adequate good faith efforts to do so.

- (1) The decision on reconsideration will be made by the DBE Liaison Officer.
- (2) The bidder will have the opportunity to meet in person with the DBE Liaison Officer to discuss the issue of whether it met the goal or made adequate good faith efforts to do so. If a meeting is desired, the bidder must be ready, willing and able to meet with the DBE Liaison Officer within 4 days of notification that it has failed to meet the requirements of this subsection.
- (3) The DBE Liaison Officer will render a written decision on reconsideration and provide notification to the bidder. The written decision will explain the basis for finding that the bidder did or did not meet the goal or make adequate good faith efforts to do so.
- (4) The result of the reconsideration process is not administratively appealable to USDOT.

### **120-3.3 COMMERCIALLY USEFUL FUNCTION (CUF).**

- a. **Creditable Work.** Measurement of attainment of the DBE Utilization Goal will be based upon the actual amount of money received by the DBEs for creditable CUF work on this project as determined by the Engineer in accordance with this Section. CUF is limited to that of a:
  - (1) regular dealer;
  - (2) manufacturer;
  - (3) broker;
  - (4) subcontractor;
  - (5) joint-venture; or
  - (6) prime contractor.
- b. **Determination of Commercially Useful Function.** In order for the CUF work of the DBE to be credited toward the goal, the Contractor will ensure that all of the following requirements are met:
  - (1) The CUF performed by a DBE certified in a supply category will be evaluated by the Engineer to determine whether the DBE performed as a broker, regular dealer, or manufacturer of the product provided to this project.
  - (2) A DBE trucking firm certified and performing work in a transportation/hauling category is restricted to credit for work performed with its own trucks and personnel certified with the CRO prior to submitting a bid to a contractor for DBE trucking. The DBE trucking firm must demonstrate that it owns all trucks (proof of title and/or registration) to be credited for work and that all operators are employed by the DBE trucking firm. A DBE trucking firm that does not certify its trucks and personnel that it employs on a job will be considered a broker of trucking services and limited to credit for a broker. (This does not effect the CUF of that same firm, when performance includes the hauling of materials for that work.)
  - (3) The DBE is certified in the appropriate category at the time of
    - (a) the Engineer's approval of the DBE subcontract, consistent with the written DBE commitment; and
    - (b) the issuance of a purchase order or service agreement by the Contractor to a DBE performing as either a manufacturer, regular dealer, or broker (with a copy to the Engineer).
  - (4) The Contractor will receive credit for the CUF performed by DBEs as provided in this Section. Contractors are encouraged to contact the Engineer in advance of the execution of the DBE's work or provision of goods or services regarding CUF and potential DBE credit.



- (5) The DBE may perform work in categories for which it is not certified, but only work performed in the DBE's certified category meeting the CUF criteria may be credited toward the DBE Utilization Goal.
- (6) The work of the DBE firm must meet the following criteria when determining when CUF is being performed by the DBE:
  - (a) The work performed will be necessary and useful work required for the execution of the Contract.
  - (b) The scope of work will be distinct and identifiable with specific contract items of work, bonding, or insurance requirements.
  - (c) The work will be performed, controlled, managed, and supervised by employees normally employed by and under the control of the certified DBE. The work will be performed with the DBE's own equipment. Either the DBE owner or DBE key employee will be at the work site and responsible for the work.
  - (d) The manner in which the work is sublet or performed will conform to standard, statewide industry practice within Alaska, as determined by the Department. The work or provision of goods or services will have a market outside of the DBE program (must also be performed by non-DBE firms within the Alaskan construction industry). Otherwise, the work or service will be deemed an unnecessary step in the contracting or purchasing process and no DBE credit will be allowed.

There will be no DBE credit for lower-tier non-DBE subcontract work.

- (e) The cost of the goods and services will be reasonable and competitive with the cost of the goods and services outside the DBE program within Alaska. Materials or supplies needed as a regular course of the Contractor's operations such as fuel, maintenance, office facilities, portable bathrooms, etc. are not creditable.

The cost of materials actually incorporated into the project by a DBE subcontractor is creditable toward the DBE goal only if the DBE is responsible for ordering and scheduling the delivery of creditable materials and fully responsible for ensuring that the materials meet specifications.

- (f) All subcontract work, with the exception of truck hauling, will be sublet by the same unit of measure as is contained in the Bid Schedule unless prior written approval of the Engineer is obtained.
  - (g) The DBE will control all business administration, accounting, billing, and payment transactions. The prime contractor will not perform the business, accounting, billing, and similar functions of the DBE. The Engineer may, in accordance with AS 36.30.420(b), inspect the offices of the DBE and audit the records of the DBE to assure compliance.
- (7) On a monthly basis, the Contractor shall report on Form 25A-336 (Monthly Summary of DBE Participation) to the CRO the payments made (canceled checks or bank statements that identify payor, payee, and amount of transfer) for the qualifying work, goods and services provided by DBEs.

- c. **Decertification of a DBE.** Should a DBE performing a CUF become decertified during the term of the subcontract, purchase order, or service agreement for reasons beyond the control of and without the fault or negligence of the Contractor, the work remaining under the subcontract, purchase order, or service agreement may be credited toward the DBE Utilization Goal.

Should the DBE be decertified between the time of Contract award and the time of the Engineer's subcontract approval or issuance of a purchase order or service agreement, the work of the decertified firm will not be credited toward the DBE Utilization Goal. The Contractor must still meet the DBE Utilization Goal by either

- (1) withdrawing the subcontract, purchase order or service agreement from the decertified DBE and expending Good Faith Effort (Subsection 120-3.2, Items (3) through (8) to replace it with one from a currently certified DBE for that same work or service through subcontractor substitution (GCP Subsection 30-01); or
  - (2) continuing with the subcontract, purchase order or service agreement with the decertified firm and expending Good Faith Effort to find other work not already subcontracted out to DBEs in an amount to meet the DBE Utilization Goal through either
    - (a) increasing the participation of other DBEs on the project;
    - (b) documenting Good Faith Efforts [Subsection 120-3.2, items (3) through (8)]; or
    - (c) by a combination of the above.
- d. **DBE Rebuttal of a Finding of no CUF.** Consistent with the provisions of 49 CFR, Part 26.55(c)(4)&(5), before the Engineer makes a final finding that no CUF has been performed by a DBE firm the Engineer will coordinate notification of the presumptive finding through the CRO to the Contractor, who will notify the DBE firm.

The Engineer, in cooperation with the CRO, may determine that the firm is performing a CUF if the rebuttal information convincingly demonstrates the type of work involved and normal industry practices establishes a CUF was performed by the DBE. Under no circumstances shall the Contractor take any action against the DBE firm until the Engineer has made a final determination. The Engineer's decisions on CUF matters is not administratively appealable to USDOT.

**120-3.4 DEFAULT OF DBE.** In the event that a DBE firm under contract or to whom a purchase order or similar agreement has been issued defaults on their work for whatever reason, the Contractor shall immediately notify the Engineer of the default and the circumstances surrounding the default.

The Contractor shall take immediate steps, without any order or direction from the Engineer, to retain the services of other DBEs to perform the defaulted work. In the event that the Contractor cannot obtain replacement DBE participation, the Engineer may adjust the DBE Utilization Goal if, in the opinion of the Engineer, the following criteria have been met:

- a. The Contractor was not at fault or negligent in the default and that the circumstances surrounding the default were beyond the control of the Contractor; and
- b. The Contractor is unable to find replacement DBE participation at the same level of DBE commitment and has adequately performed and documented the Good Faith Effort expended in accordance with items (3) through (8) of Subsection 120-3.2 for the defaulted work; or
- c. It is too late in the project to provide any real subcontracting opportunities remaining for DBEs.

The DBE Utilization Goal will be adjusted to reflect only that amount of the defaulted DBE's work that cannot be replaced.

**120-4.1 METHOD OF MEASUREMENT.** The Contractor will be entitled to count toward the DBE Utilization Goal those monies actually paid to certified DBEs for CUF work performed by the DBE as determined by the Engineer. The Contractor will receive credit for the utilization of the DBEs, as follows:

- a. Credit for the CUF of a DBE prime contractor is 100% of the monies actually paid to the DBE under the contract for creditable work and materials in accordance with 49 CFR 26.55.
- b. Credit for the CUF of a subcontractor is 100% of the monies actually paid to the DBE under the subcontract for creditable work and materials. This shall include DBE trucking firms certified as a subcontractor and not a broker. Trucks leased from another DBE firm shall also qualify for credit and conforms to the provisions of 49 CFR 26.55(d).
- c. Credit for the CUF of a manufacturer is 100% of the monies paid to the DBE for the creditable materials manufactured.
- d. Credit for the CUF of a regular dealer of a creditable material, product, or supply is 60% of its value. The value will be the actual cost paid to the DBE but will not exceed the bid price for the item.
- e. Credit for the CUF of a broker performed by a DBE certified in a supply category for providing a creditable material, product or supply is limited to a reasonable brokerage fee. The brokerage fee will not exceed 5% of the cost of the procurement contract for the creditable item.
- f. Credit for the CUF of a broker performed by a DBE certified in the transportation/hauling category for arranging for the delivery of a creditable material, product or supply is limited to a reasonable brokerage fee. The brokerage fee will not exceed 5% of the cost of the hauling subcontract.
- g. Credit for the CUF of a broker performed by a DBE certified in a bonding or insurance category for arranging for the provision of insurance or bonding is limited to a reasonable brokerage fee. The brokerage fee will not exceed 5% of the premium cost.
- h. Credit for the CUF of a joint venture (JV) (either as the prime contractor or as a subcontractor) may not exceed the percent of the DBE's participation in the joint venture agreement, as certified for this project by the Department. The DBE joint venture partner will be responsible for performing all of the work as delineated in the certified JV agreement.

**120-5.1 BASIS OF PAYMENT.** Work under this item is subsidiary to other contract items and no payment will be made for meeting or exceeding the DBE Utilization Goal.

If the Contractor fails to utilize the DBEs listed on Form 25A-325C as scheduled or fails to submit required documentation to verify proof of payment or documentation requested by the Department to help in the determination of CUF, the Department will consider this to be unsatisfactory work. If the Contractor fails to utilize Good Faith Efforts to replace a DBE, regardless of fault (except for Subsection 120-3.4 item c.), the Department will also consider this unsatisfactory work. Unsatisfactory work may result in disqualification of the Contractor from future bidding under GCP Subsection 20-13 and withholding of progress payments consistent with GCP Subsection 90-06.



STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

## 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 goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate work force in each trade on all construction work in the covered area, are as set forth in item 20.

These goals as listed in item 20 are applicable to all the Contractor's construction work (whether or not it is federal or federally-assisted) performed in the covered area.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally and non-federally involved construction.

The hours on minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

18. 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.

19. As used in the Bid Notice, and in the contract resulting from this project's solicitation, the "covered area" is the State of Alaska.

20. Goal and Timetable

- a. The following goal and timetable for female utilization shall be included in all federal and federally-assisted construction contracts and subcontracts in excess of \$10,000. The goal is applicable to the Contractor's aggregate on-site construction work force whether or not part of that work force is performing work on a federal or federally assisted construction contract or subcontract.

**ALASKA GOAL AND TIMETABLE FOR WOMEN\***

<u>Timetable</u>	<u>Goal</u> **
Until Further Notice	6.9%

- b. The following goals and timetable for minority utilization shall be included in all federal or federally-assisted construction contracts and subcontracts in excess of \$10,000 to be performed in Alaska. The goals are applicable to the Contractor's aggregate on-site construction work force whether or not part of that work force is performing work on a federal or federally-assisted construction contract or subcontract.

**ALASKA GOALS AND TIMETABLE FOR MINORITY UTILIZATION**

<u>Timetable</u>	<u>Economic Area (EA)***</u>	<u>Goals</u> **
Until Further Notice	Anchorage SMSA Area	08.7%
	Remainder of State	15.1%

\* The goal and timetable for women listed above applies to Alaska as well as nationwide.

\*\* The Director, from time to time, shall issue goals and timetables for minority and female utilization that shall be based on appropriate work force, demographic or other relevant data and which shall cover construction projects, or construction contracts performed in specific geographical areas. The goals shall be applicable to each construction trade in a covered Contractor's or subcontractor's entire work force which is working in the area covered by the goals and timetables, shall be published as notices in the FEDERAL REGISTER, and shall be inserted by the contracting officers and applicants, as applicable, in the Notice required by 41 CFR 60-4.2. 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.

\*\*\* Refer to the Standard Metropolitan Statistical Areas (SMSA) and Economic Areas (EA), Office of Management and Budget, 1975.





STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

**DISADVANTAGED BUSINESS ENTERPRISE (DBE)  
SUBCONTRACTABLE ITEMS**

Federal-Aid Contracts  
**ANC Access Control System Replacement**  
**Project No. AIP 3-02-0016-XXX-2008/58300**

The original DBE Utilization Goal for this project is: 0 % of the basic bid amount.

The following is the list of subcontractable items by category/subcategory that must be considered under Section 120, DBE Program, Good Faith Effort Criteria.

BID ITEM NO.	DESCRIPTION OF WORK OR PORTION OF WORK	CATEGORY

(Continued on Reverse Side)





STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

**CONTACT REPORT**  
Federal-Aid Contracts

**ANC Access Control System Replacement**  
**Project No. AIP 3-02-0016-XXX-2008/58300**

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 [ ] Mail [ ] FAX [ ] Other  
2. Person \_\_\_\_\_  
Contacted \_\_\_\_\_

_____ Name	_____ Title
---------------	----------------

3. DBE's Response: Date: \_\_\_\_\_ Method: [ ] Phone [ ] Mail [ ] 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 [ ] Mail [ ] FAX [ ] Other  
2. Person \_\_\_\_\_  
Contacted \_\_\_\_\_

_____ Name	_____ Title
---------------	----------------

3. DBE's Response: Date: \_\_\_\_\_ Method: [ ] Phone [ ] Mail [ ] 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.  
c. [ ] Yes [ ] No Provided all appropriate information concerning the specific work items or materials.

2. Was the DBE's quote non-competitive (i.e., more than 10% higher than the accepted quote)? [ ] 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  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

**DISADVANTAGED BUSINESS ENTERPRISE  
UTILIZATION REPORT**

Federal-Aid Contracts

**ANC Access Control System Replacement**  
**Project No. AIP 3-02-0016-XXX-2008/58300**

**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, telephone number, bid items or portions of work to be performed indicated by item number, type of DBE credit claimed [prime contractor (P), joint venture (JV), subcontractor (sub), regular dealer (rd), broker (b), or manufacturer (m)], and the creditable dollar amount to be counted toward the goal.

FIRM NAME	PHONE #	BID ITEM, WORK, OR PRODUCT <sup>2</sup>	TYPE OF CREDIT <sup>1</sup>	CREDITABLE DOLLAR AMOUNT <sup>1</sup>
				\$
				\$
				\$
				\$
				\$
				\$

Total creditable DBE Utilization Amount \$ \_\_\_\_\_

Basic Bid Amount \$ \_\_\_\_\_

DBE Utilization as % of Basic Bid Amount \_\_\_\_\_ %

Original DBE Project Goal \_\_\_\_\_ 0 %

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

\_\_\_\_\_  
Title

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

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

( )

\_\_\_\_\_  
Date

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

1. See DBE Specification (Section 120) for determining type and amount of credit claimed for contract award.
2. Identify specific pay item, product, or component of work to be performed by DBE.



STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES  
Civil Rights Office – DBE Program

**PRIME CONTRACTOR'S WRITTEN DBE COMMITMENT**

Federal-Aid Contracts

**ANC Access Control System Replacement**  
**Project No. AIP 3-02-0016-XXX-2008/58300**

All firms bidding on Alaska Department of Transportation and Public Facilities (DOT&PF) projects must have a written commitment from each DBE firm to be subcontracted. Please complete this form for each DBE firm and submit to the DOT&PF Regional Compliance Officer.

If you have any questions, please call (907) 269-0851.

Name of DBE Firm: \_\_\_\_\_

Street Address: \_\_\_\_\_

Mailing Address: \_\_\_\_\_ City: \_\_\_\_\_

State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Telephone Number: \_\_\_\_\_ Fax number: \_\_\_\_\_

Description of the work that DBE firm will perform: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Please provide additional information on a separate sheet of paper.

The dollar amount of participation by the DBE firm: \$ \_\_\_\_\_

Signatures of Authorized representatives of the Prime Contractor and the DBE firm below represent the written commitment by the Prime Contractor to subcontract with the DBE firm as described above and a written commitment by the DBE firm to subcontract for the work described above:

\_\_\_\_\_  
Prime Contractor Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
DBE Firm Signature

\_\_\_\_\_  
Date

Prime Contractor Firm: \_\_\_\_\_

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

\_\_\_\_\_

\_\_\_\_\_

Telephone Number: \_\_\_\_\_ Fax number: \_\_\_\_\_



STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

**SUMMARY OF GOOD FAITH EFFORT DOCUMENTATION**  
Federal-Aid Contracts  
ANC Access Control System Replacement  
Project No. AIP 3-02-0016-XXX-2008/58300

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  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

**EEO-1 CERTIFICATION**

Federal-Aid Contracts

**ANC Access Control System Replacement  
Project No. AIP 3-02-0016-XXX-2008/58300**

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



STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

**PROPOSAL**  
**of**

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_  
\_\_\_\_\_

**To the CONTRACTING OFFICER, DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES:**

In compliance with your Invitation for Bids dated **January 04, 2008**, the Undersigned proposes to furnish and deliver all the materials and do all the work and labor required in the construction of Project:

**ANC Access Control System Replacement**  
**Project No. AIP 3-02-0016-XXX-2008/58300**

Located at or near **Anchorage, 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 State of Alaska, Department of Transportation and Public Facilities 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 and to complete the work within **N/A** calendar days after the effective date of Notice to Proceed, unless extended in writing by the Contracting Officer.

OR:

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 by **October 24, 2009**, with interim completion dates as described in Section 01015, unless extended in writing by the Contracting Officer.

The Undersigned proposes to furnish Payment Bond in the amount of 50% and Performance Bond in the amount of 50% (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

\_\_\_\_\_  
Fax Number

## **BID SCHEDULE**

### **ANC Access Control System Replacement AIP 3-02-0016-XXX-2008/58300**

Bidders Please Note: Before preparing this bid schedule, read carefully, "Information to Bidders", "Supplementary 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. No price is to be entered or tendered for any item not appearing in the bid schedule.

Conditioned or qualified bids will be considered non-responsive.

The DBE Utilization Goal for this project is 0.0% of the total contract award amount. See Section 00120 for details.

**NOTICE:** The Basic Bid work is divided into two segments, Phase 1 and Phase 2, as described in Section 01010. Bid award will be based on the mathematical sum of the bid price for Basic Bid Phase 1 and Basic Bid Phase 2, plus Additive Alternate 1 (if funded); however contract award will be made for Basic Bid Phase 1 only. Subject to legislative authority and federal funding, Basic Bid Phase 2 and Additive Alternate 1 work will be added to the contract by Change Order, at the price indicated on the Bid Schedule. The maximum amount of award for Basic Bid Phase 1 of this contract is Three Hundred Thousand Dollars and no cents (\$300,000.00). The Department will not award the bid to any bidder whose Basic Bid for Phase 1 work exceeds this amount. Bidders are cautioned that the Department cannot guarantee the funding for Basic Bid Phase 2 or Additive Alternate 1 will be available. If funding is not available for Basic Bid Phase 2 and/or Additive Alternate 1 work, non-award of this work will not be considered a termination and will not be the basis for an adjustment to the contract price for Basic Bid Phase 1 work. By submission of a bid for Basic Bid Phase 1, each bidder is ensuring that it can complete Phase 1 work for the Basic Bid Phase 1 price, even if Basic Bid Phase 2, and/or Additive Alternative 1, is not awarded.

In order to establish a clear and definitive basis of award, the state has established a budgeted project amount, to be announced just prior to the bid opening, from which the order of bidders will be determined. The low bid will be determined by considering the basic bid (Phase 1 and Phase 2) and additive alternate(s) in the order listed up to a total, not to exceed the budgeted amount. The state reserves the right to reject all bids and to award the contract above or below the budgeted amount to the low bidder based on any combination of basic bid and additive alternate(s) as long as the low bidder remains unchanged.

PAY ITEM	DESCRIPTION OF PAY ITEM	TOTAL BID PRICE, IN FIGURES
1	<u>BASIC BID PHASE 1</u> Furnish all labor, material, equipment, supervision, and provide all work to complete the scope of work as described in Section 01010, Paragraph 1.03 A - 1, for the lump sum price of:	\$ _____
2	<u>BASIC BID PHASE 2</u> Furnish all labor, material, equipment, supervision, and provide all work to complete the scope of work as described in Section 01010, Paragraph 1.03 A - 2, for the lump sum price of:	\$ _____

Total Basic Bid: \$ \_\_\_\_\_  
(Pay Item 1 + Pay Item 2)

PAY ITEM	DESCRIPTION OF PAY ITEM	TOTAL BID PRICE, IN FIGURES
3	<u>ADDITIVE ALTERNATE 1</u> Furnish all labor, material, equipment, supervision, and provide all work to complete the scope of work as described in Section 01010, Paragraph 1.03 B, for the lump sum price of:	\$ _____

\_\_\_\_\_  
Name of Bidding Firm (printed)



STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

**BID BOND**

For  
**ANC Access Control System Replacement**  
**Project No. AIP 3-02-0016-XXX-2008/58300**

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

PRINCIPAL (Legal name and business address):

TYPE OF ORGANIZATION:

	<input type="checkbox"/> Individual	<input type="checkbox"/> Partnership
	<input type="checkbox"/> Joint Venture	<input type="checkbox"/> Corporation
STATE OF INCORPORATION:		

SURETY(IES) (Name and business address):

A.	B.	C.
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 for Bids 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.







STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

**BUY AMERICAN CERTIFICATE**

Federal-Aid Airport Contracts

**ANC Access Control System Replacement**

**Project No. AIP 3-02-0016-2008/58300**

By submitting a bid under this solicitation, except for those items listed by the offeror below or on a separate and clearly identified attachment, the offeror certifies that steel and each manufactured product is produced in the United States (as defined in Subsection 60-09, Buy American Steel and Manufactured Products for Construction Contracts) and that components of unknown origin are considered to have been produced or manufactured outside the United States.

Attach manufacturer's mill test reports with the Buy American Certification signed by the manufacturer.

Articles, materials, and supplies excepted from this provision are listed on the reverse of this form.

PRODUCT <sup>1</sup>	COUNTRY OF ORIGIN

Contractor

Signature of Contractor's Representative

Date

1. Enter "NONE" on the first line if there are no exceptions.

**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.







STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES  
Civil Rights Office – DBE Program

## BIDDER REGISTRATION

All firms must register annually or prior to project award with the Alaska Department of Transportation and Public Facilities (DOT&PF) Civil Rights Officer (CRO). Complete this form for each contractor and subcontractor.

Name of Firm: \_\_\_\_\_

Street Address: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Telephone Number: \_\_\_\_\_ Fax number: \_\_\_\_\_

E-mail Address: \_\_\_\_\_ Date Firm was Established: \_\_\_\_\_

**Is this firm a (check all that apply):**

Prime Contractor? ☐ Yes ☐ No

Subcontractor? ☐ Yes ☐ No

Service Provider? ☐ Yes ☐ No

Material Supplier? ☐ Yes ☐ No

Manufacturer? ☐ Yes ☐ No

Certified DBE? \* ☐ Yes\* ☐ No

Identify specialty: \_\_\_\_\_

Identify service: \_\_\_\_\_

Identify material: \_\_\_\_\_

Identify product: \_\_\_\_\_

\* Complete Page 2 of this form

**Type of contracts/proposals bid by the firm:**

☐ Highways ☐ Airports ☐ Mass Transit

☐ Other (specify) \_\_\_\_\_

**Firm's gross annual receipts:**

☐ < \$500,000

☐ \$500,000 - \$999,999

☐ \$1,000,000 - \$4,999,999

☐ \$5,000,000 - \$9,999,999

☐ \$10,000,000 - \$16,999,999

☐ > \$17,000,000

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

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

\_\_\_\_\_  
**Date**

Send this completed form to:

OR

You may fax your completed form to:

**ADOT&PF Civil Rights Office  
PO Box 196900  
Anchorage, Alaska 99519-6900**

**(907) 269-0847**

If you have any questions, please call **(907) 269-0851**.

**ADDITIONAL INFORMATION REQUIRED  
FOR BUSINESSES CERTIFIED IN THE ADOT&PF DBE PROGRAM**

**Notice to DBE Firms:** All businesses are required to submit a Bidder's Registration form before an ADOT&PF contract can be awarded. The Bidder's Registration form must be submitted on an annual basis by July 1 and is valid through June 30 the following year. DBEs are required to indicate on this form if they wish to be a required contact for prime contractors performing DBE Good-Faith Efforts (GFE). A DBE that either does not submit a Bidder's Registration by July 1 or indicate they are not interested in being a required contact, will be listed in the directory as a non-required contact. DBEs that are a non-required contact will not have to be contacted by contractors demonstrating a GFE.

**A. DBE Directory Information**

1. Does your firm wish to receive bid solicitations from contractors seeking DBE participation in your DBE Work Category? (If "No" is checked, skip Questions 2 and 3.) [ ] Yes    [ ] No
2. What ADOT&PF defined region of the state are you willing to work or provide services? [ ] Northern  
[ ] Central  
[ ] Southeast  
[ ] Out of State

3. Bid  
Contact  
Info.

\_\_\_\_\_  
Name

\_\_\_\_\_  
Title

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

\_\_\_\_\_  
Fax Number

\_\_\_\_\_  
Email Address

\_\_\_\_\_  
Company Website

**Instructions**

**A. DBE Directory Information (See below for Instructions)**

1. Indicate choice by checking "Yes" or "No."

"Yes" means that your firm will be a required contact for contractors demonstrating a GFE. Your firm will be expected to maintain a means of receiving bid request communications and provide responses to contractor's bid requests.

"No" means that your firm does not wish to receive bid solicitations from contractors performing a GFE. Your firm will be listed in the DBE directory. Answering "No" does not change your DBE certification status, however in doing so, you assume full responsibility for notifying contractors that you wish to bid on a specific project.

2. Indicate choice(s) of all that apply to your firm.

3. Bid Contact Information. Please enter the contact person information for the individual in your company that will be responding to GFE bid solicitations. This information will be published in the DBE Directory.



STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

## CONSTRUCTION CONTRACT

ANC Access Control System Replacement  
Project No. AIP 3-02-0016-XXX-2008/58300

This CONTRACT, between the STATE OF ALASKA, DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES, herein called the Department, 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 Department, 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 Department. In no event shall the Department 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 Department. 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 Department, 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 Department, to complete the furnishing and delivery of materials and the doing and performance of the work before the aforesaid date, the Department 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 Department 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

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Company Name

---

Signature of Authorized Company Representative

---

Typed Name and Title

---

Date

(Corporate Seal)

---

## STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

---

Signature of Contracting Officer

---

Typed Name

---

Date



STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

**PERFORMANCE BOND**

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

For  
**ANC Access Control System Replacement**  
**Project No. AIP 3-02-0016-XXX-2008/58300**

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 Department of  
Transportation and Public Facilities 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 Department of Transportation & Public Facilities 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.



STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

**PAYMENT BOND**

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

For  
**ANC Access Control System Replacement**  
**Project No. AIP 3-02-0016-XXX-2008/58300**

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-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 Department of Transportation & Public Facilities 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.



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:

---

---

---

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

---

---

---

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

---

---

---

**C. EXPERIENCE**

1. Have you had previous construction contracts or subcontracts with the State of Alaska?  
☐ Yes ☐ No

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

---

---

---

---

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

**STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES  
DOCUMENT 00700 - ISSUED JULY 1985**

**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
- 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

#### **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 Preferential Employment
- 7.14 Wages and Hours of Labor
- 7.15 Overtime Work Hours and Compensation
- 7.16 Covenant Against Contingent Fees
- 7.17 Officials Not to Benefit
- 7.18 Personal Liability of Public Officials

#### **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 DEPARTMENT'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

#### **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
- 10.11 Disadvantaged and Women Business Enterprises (DBE and WBE) Program

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

- 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

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

- 12.1 Warranty and Guaranty
- 12.2 Access to Work
- 12.3 Tests and Inspections
- 12.4 Uncovering Work
- 12.5 DEPARTMENT 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 DEPARTMENT may Correct Defective Work

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

- 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

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

- 14.1 DEPARTMENT May Suspend Work
- 14.2 Default of Contract
- 14.3 Rights or Remedies
- 14.4 Convenience Termination

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

- 15.1 Notification
- 15.2 Presenting Claim
- 15.3 Claim Validity, Additional Information & Project Manager's Action
- 15.4 Contracting Officer's Decision

#### **ACKNOWLEDGMENT**

"The State of Alaska, 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 to preprint portions of the NSPE document 1910-8, 1983 edition does not constitute approval of the State of Alaska 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 and shall not be considered as having bearing on their interpretation.

Whenever used in the Specifications or other Contract Documents the following terms have the meaning indicated which are applicable to both the singular and plural thereof. Working titles that have a masculine gender, are intended to refer to persons of either sex.

Terms not defined below shall have their ordinary accepted meanings within the context that they are used. Words that 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 capitalized throughout these General Conditions.

**Addenda** - All clarifications, corrections, or changes issued graphically or in writing by the DEPARTMENT 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.

**Application for Payment** - The form provided by the DEPARTMENT 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** - Means written approval by the Contracting Officer or his authorized representative as defined in Article 2.1.

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

**Award** - The acceptance, by the DEPARTMENT, 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 DEPARTMENT directing changes to the Contract Documents, within their general scope.

**Conditions of the Contract** - Those portions of the Contract Documents that define the rights and responsibilities of the contracting parties and of others involved in the Work. The Conditions of the Contract include General Conditions, Supplementary Conditions and other conditions.

**Consultant** - The person, firm, or corporation retained directly by the DEPARTMENT 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 DEPARTMENT 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 DEPARTMENT 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 DEPARTMENT. He 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 DEPARTMENT for performance of the Work.

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

**Contract Time** - The number of Calendar Days or the date specified in the construction Contract and authorized time extensions that identify how much time the CONTRACTOR is allowed to achieve Final Completion.

**Controlling Item** - Any feature of the Work considered at the time by the Contracting Officer as essential to the orderly completion of the Work and which, if delayed, will delay the time of Final Completion of the Contract (such as an item of Work on the critical path of a network schedule).

**Defective** - An adjective that refers to Work that is unsatisfactory, faulty or deficient, or does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or Approval referred to in the Contract Documents, or has been damaged prior to the DEPARTMENT's Approval.

**DEPARTMENT** - The Alaska Department of Transportation and Public Facilities. References to "Owner", "State", "Contracting Agency", mean the DEPARTMENT.

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

**Effective Date of the Contract** - The date on which the Contract is fully executed by both CONTRACTOR and the DEPARTMENT.

**Final Acceptance** - The DEPARTMENT'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.

**General Requirements** - Sections of Division I of the Specifications that contain administrative and procedural requirements as well as requirements for temporary facilities applying to Specification Divisions 2 through 16.

**Holidays** - In the State of Alaska, Legal Holidays occur on:

1. New Years 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.

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

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

**Notice of Intent to Award** - The written notice by the DEPARTMENT to all Bidders identifying the apparent successful Bidder and establishing the DEPARTMENT'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.

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

**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 the DEPARTMENT accepts his Proposal.

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

**Schedule of Values** - The DEPARTMENT'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 that 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.

**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 evidenced by the DEPARTMENT'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 DEPARTMENT covering work that is not within the general scope of the Contract.

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

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

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

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

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

**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 DEPARTMENT and to exercise the rights, responsibilities, authorities and functions vested in the Contracting Officer by the Contract Documents, except that the Contracting Officer shall have the right to designate in writing authorized representatives to act for him. 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 DEPARTMENT 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. The Contracting Officer may, at any time during the performance of this Contract, vest in any such authorized representatives additional power and authority to act for the Contracting Officer or designate additional representatives, specifying the extent of their authority to act for the Contracting Officer; a copy of each document vesting additional authority in or removing that authority from an authorized representative or designating an additional authorized representative shall be furnished to the CONTRACTOR. The head of the Contracting Agency reserves the right to appoint a new Contracting Officer without affecting any of the CONTRACTOR's obligations to the DEPARTMENT under this Contract.
- 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 his authorized representative designate Consultant(s) to act for the DEPARTMENT 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.
- 2.1.4 The term "Contracting Officer" when used in the text of these General Conditions or other Contract Documents following this section shall also mean any duly authorized representative of the Contracting Officer when authorized in accordance with Paragraph 2.1.1.

### **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 DEPARTMENT 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 his 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 DEPARTMENT 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 DEPARTMENT 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 DEPARTMENT 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 DEPARTMENT 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 DEPARTMENT or any of the DEPARTMENT'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 his own risk and expense. However, the CONTRACTOR shall not be liable to the DEPARTMENT 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 DEPARTMENT shall have or acquire any title to or ownership rights in any of the Contract Documents (or copies thereof) prepared by or for the DEPARTMENT 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 DEPARTMENT.



## **ARTICLE 4 - LANDS AND PHYSICAL CONDITIONS**

### **4.1 Availability of Lands:**

The DEPARTMENT 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 DEPARTMENT, 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.

### **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 DEPARTMENT in preparation of the Contract Documents. The CONTRACTOR may for his 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 DEPARTMENT by the owners of such underground utilities.

#### **4.4.1 NOT USED**

#### **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 the local fire authority has approved provisions for continued service.**

### **4.5 Damaged Utilities:**

When the CONTRACTOR damages utilities, 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 DEPARTMENT, 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 owner has located the utility..
- 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 DEPARTMENT 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 will be provided the DEPARTMENT on a weekly basis with variations between the Contract Documents and actual field conditions identified. Survey notes are to be in a format acceptable to the DEPARTMENT.

## 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 DEPARTMENT (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 his option copy the Surety with notice of any potential default or liability.

The Contracting Officer shall determine the adequacy of bonds that are provided by individual Surety at the option of the CONTRACTOR. Any costs incurred by the CONTRACTOR or individual Surety shall be borne by the CONTRACTOR. Where individual Sureties are used, two individual Sureties must each provide the State of Alaska with security equal to the amount of each bond by one, or a combination of, the following methods:

- a. Escrow account in the name of the DEPARTMENT for the duration of the Contract. Acceptable securities would include, but not necessarily be limited to: cash; treasury notes; bearer instruments having a specific value, or; money market certificates.
- b. First *Deed of Trust* with the DEPARTMENT designated as beneficiary, against the unencumbered value of the real property located within the State of Alaska, or an agreement by any second party, including deeds of trust, mortgage, lien or judgment interests to subrogate their interests to that of the State of Alaska in the real property which has been offered by the individual Surety.

A title insurance policy with the State of Alaska as a named beneficiary and a current (within 3 months) professional appraisal or assessed valuation will be required to ascertain the true value of the property offered as collateral. If buildings or other valued improvements are involved then fire and casualty insurance with the State of Alaska as a named insured and in limits and coverage acceptable to the Contracting Officer shall be required. The appraiser shall acknowledge in writing that the appraisal is prepared for the benefit of the DEPARTMENT and the DEPARTMENT has the right to rely on its contents. This *Deed* must be recorded in the recording office where the property is located.

With respect to clauses "a" and "b" above the *Deed of Trust* or other accepted security shall not be released until 12 months after Final Acceptance of the Project and settlement of all outstanding claims.

### 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 DEPARTMENT, or if any such Surety fails to furnish reports as to his financial condition as requested by the DEPARTMENT, the CONTRACTOR shall within five days thereafter substitute another bond and Surety, both of which must be acceptable to DEPARTMENT.

A corporate Surety may replace an individual Surety during the course of the Contract period. If the Surety desires to dispose of the collateral posted, the DEPARTMENT 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 DEPARTMENT covering injury to persons and/or property suffered by the State of Alaska or a third party, as a result of operations that 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 DEPARTMENT 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 Work under this agreement the following policies of insurance. 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 coverage 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. Employer's Liability Protection in the amount of \$100,000 per person/\$100,000 per occurrence;
2. 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.

- 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:

\$500,000 each occurrence

\$1,000,000 aggregate

2. If the CONTRACTOR carries a Commercial General Liability policy, the limits of liability shall not be less than:

\$500,000 each occurrence (Combined Single Limit for bodily injury and property damage)

\$500,000 for Personal Injury Liability

\$1,000,000 aggregate for Products-Completed Operations

\$1,000,000 general aggregate

The State of Alaska, Department of Transportation and Public Facilities shall be named as an "Additional Insured" under all liability coverage 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 DEPARTMENT, the CONTRACTOR and his 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 coverage the CONTRACTOR shall ensure that Subcontractors provide insurance coverage as noted in clauses a., b., and c. of this subparagraph. Builder's Risk insurance will only be applicable to Subcontractors if so noted in the Supplementary Conditions.

- e. Other Coverage:

As specified in the Supplementary Conditions.

- 5.4.3 Evidence, consisting of a certificate of insurance or the policy declaration page with required endorsements attached thereto - all of which have been executed by the insurer's representative and issued to the DEPARTMENT - shall denote the type, amount, class of operations covered, effective (and retroactive) dates, and dates of expiration of policies.

Evidence pertaining to Worker's Compensation, General Liability, or Automobile Liability is required for Award. All other coverage shall be evidenced prior to commencement of Work. Acceptance by the DEPARTMENT of deficient evidence does not constitute a waiver of Contract requirements as provided for by the Conditions of the Contract.

If a certificate is submitted as evidence it shall contain the following statement:

"This is to certify that the policies described herein comply with all aspects of the insurance requirements of (Contract Name and Number, and Project Number)."

## **5.5 Indemnification:**

The CONTRACTOR shall indemnify, save harmless, and defend the DEPARTMENT, 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 DEPARTMENT'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 DEPARTMENT. 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 DEPARTMENT or any of the DEPARTMENT'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 reasonable time prior to the preconstruction conference, 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.

6.6.2 Within fifteen days after the date of the Notice to Proceed, the CONTRACTOR shall submit to the Contracting Officer for review:

Anticipated schedule of Shop Drawing submissions; and

Anticipated Schedule of Values for all of the Work that 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 that 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 DEPARTMENT 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 DEPARTMENT 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 DEPARTMENT as providing a workable arrangement for processing the submissions. If accepted, the finalized Schedule of Values will be acknowledgment by the DEPARTMENT 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 DEPARTMENT or relieve the CONTRACTOR of his responsibility to adjust his 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, the Contracting Officer may accept materials or equipment of other Suppliers only if sufficient information is submitted by the CONTRACTOR clearly demonstrating 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 The CONTRACTING OFFICER will not accept requests for review of substitute items of material and equipment 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 DEPARTMENT 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 DEPARTMENT in evaluating the proposed substitute. The DEPARTMENT 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 DEPARTMENT.

#### **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 submitted for Approval must contain provisions for payment for Work done by the Subcontractor within 7 days of receipt of payment by the CONTRACTOR. No acceptance by the Contracting Officer of any such Subcontractor shall constitute a waiver of any right of the DEPARTMENT to reject Defective Work.
- 6.13.2 The CONTRACTOR shall be fully responsible to the DEPARTMENT 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 DEPARTMENT 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 DEPARTMENT and any such Subcontractor, Supplier or other person or organization, nor shall it create any obligation on the part of the DEPARTMENT 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 DEPARTMENT 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, the CONTRACTOR shall remedy such conditions with no change in Contract Price or Contract Time.



- 6.13.6 The CONTRACTOR shall include on his 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 such owner make any claim against the DEPARTMENT or occupant because of the performance of the Work, the CONTRACTOR shall hold the DEPARTMENT 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 DEPARTMENT, 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 DEPARTMENT 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 DEPARTMENT 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 DEPARTMENT of his intent. The DEPARTMENT 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 DEPARTMENT.

**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 DEPARTMENT shall be responsible for all DEPARTMENT review costs resulting from the initial submission and for the re-submittal. The CONTRACTOR shall, at the discretion of the Contracting Agency, pay all review costs incurred by the DEPARTMENT 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 DEPARTMENT. 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 his Sureties of any of his 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 not 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 his 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, his 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 DEPARTMENT 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 DEPARTMENT or its assigned representative may perform an audit of these records during normal work hours after written notice to the CONTRACTOR.

## **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 DEPARTMENT 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 DEPARTMENT 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 DEPARTMENT 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 Department 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 DEPARTMENT, 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 DEPARTMENT 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 DEPARTMENT 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 DEPARTMENT 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 his 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 Department of Commerce. A partnership or joint venture shall be considered registered if one of the general partners or venturers 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 that requires construction in accordance with applicable local building codes and 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 is 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 venturers 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 bid documents designate the use of Alaska products. 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 Department 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 DEPARTMENT upon written request or as otherwise provided within the Contract Documents.

**7.13 Preferential Employment:**

The CONTRACTOR shall comply with all applicable and valid laws and regulations regarding the hiring of Alaska residents now in effect or that might subsequently take effect during the term of this Contract. In order to ensure that CONTRACTOR's Subcontractors will comply with all applicable laws and regulations regarding the hiring of Alaska residents now in effect or that might subsequently take effect, the CONTRACTOR shall include in its contracts with Subcontractors under this Contract language that is substantially the same as the first sentence of this provision.

**7.14 Wages and Hours of Labor:**

- 7.14.1 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 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 with the Work he performed. The CONTRACTOR and his Subcontractors shall attend all hearings and conferences and produce such books, papers, and documents all as requested by the Department of Labor. Should federal funds be involved, the appropriate federal agency shall also receive a copy of the CONTRACTOR'S certified payrolls.
- 7.14.2 The following labor provisions shall also apply to this Contract:
- a. The CONTRACTOR and his 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 DEPARTMENT 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.

**7.15 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 his 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 DEPARTMENT 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.

**7.16 Covenant Against Contingent Fees:**

The CONTRACTOR warrants that no person or selling agent has been employed or retained to solicit or secure this Contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the

CONTRACTOR for the purpose of securing business. For breach or violation of this warrant, the DEPARTMENT shall have the right to annul this Contract without liability or, in its discretion, to deduct price of consideration from the Contract or otherwise recover the full amount of such commission, percentage, brokerage, or contingent fee.

**7.17 Officials Not to Benefit:**

No member of or delegate to the U.S. Congress, the Alaska State Legislature or other state official shall be admitted to any share or part of this Contract, nor to any benefit that may arise there from. However, this provision shall not be construed to extend to this Contract if made with a corporation for its general benefit.

**7.18 Personal Liability of Public Officials:**

In carrying out any of the provisions thereof, or in exercising any power or authority granted to the Contracting Officer by the Contract, there will be no liability upon the Contracting Officer nor upon state employees authorized as his representatives, either personally or as officials of the State of Alaska, it being always understood that in such matters they act as agents and representatives of the DEPARTMENT.



## **ARTICLE 8 - OTHER WORK**

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

- 8.1.1 The DEPARTMENT 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 his 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 his 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 DEPARTMENT 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 DEPARTMENT (or the DEPARTMENT, if the DEPARTMENT is performing the additional work with the DEPARTMENT'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 DEPARTMENT 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 DEPARTMENT, 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 nonapparent defects and deficiencies in the other work.

### **8.4 Coordination:**

If the DEPARTMENT 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 DEPARTMENT 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.**

One or more of following means shall be used to authorize additions, deletions, or revisions in the Work within the general scope of the Contract as specified in 9.1:

- 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 that 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 that 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**

For changes within the scope of the Work, a change in Contract Time, Contract Price, or responsibility may be made only by Change Order. Upon receipt of an executed Change Order, the CONTRACTOR shall promptly proceed with the Work involved that 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.

## **9.5 Shop Drawing Variations**

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

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

When the Contracting Officer determines that a change is outside the general scope of the Contract, it must be authorized by a Supplemental Agreement signed by the appropriate representatives of the DEPARTMENT 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 equitable adjustment shall be made and the Contract modified in writing accordingly.
- 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.

## **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 his 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:**

The value of any Work covered by a Change Order for an increase or decrease in the Contract Price shall be determined in one of the following ways:

- 10.3.1 Where the Work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved (subject to the provisions of subparagraphs 10.9.1 through 10.9.3, inclusive).
- 10.3.2 By mutual acceptance of a lump sum price which includes overhead and profit.
- 10.3.3 When 10.3.1 and 10.3.2 are inapplicable, on the basis of the "cost of the work" (determined as provided in paragraphs 10.4 and 10.5) plus a CONTRACTOR's fee for overhead and profit (determined as provided in paragraph 10.6).
- 10.3.4 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 his 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 DEPARTMENT, 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 DEPARTMENT 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 include, but not 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 superintendents and foremen at the site. 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 DEPARTMENT.
- 10.4.2 Cost of all materials and equipment furnished and incorporated 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 DEPARTMENT deposits funds with the CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to the DEPARTMENT. All trade discounts, rebates and refunds and all returns from sale of surplus materials and equipment shall accrue to the DEPARTMENT, 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 DEPARTMENT, CONTRACTOR shall obtain competitive quotes from Subcontractors or Suppliers acceptable to the CONTRACTOR and shall deliver such quotes to the DEPARTMENT 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's "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 DEPARTMENT 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.
- 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 DEPARTMENT. 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 DEPARTMENT 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 twenty 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 of all Subcontractors and multiple tiers thereof shall be fifteen percent;
  - 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 DEPARTMENT 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 ten 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 DEPARTMENT 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 DEPARTMENT 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.

#### **10.11 Disadvantaged and Women Business Enterprises (DBE & WBE) Program:**

The Contract Price shall be adjusted by such means as provided in the section entitled "Phase III - Determination of Liquidated Damages and Bonuses", DISADVANTAGED AND WOMEN BUSINESS ENTERPRISE (DBE & WBE) PROGRAM, Form 25A300.

## **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 Final 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 Final Completion.

### **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 DEPARTMENT in its contractual capacity, acts of another contractor in the performance of a contract with the DEPARTMENT, 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 DEPARTMENT 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 his Sureties shall be liable for damages resulting from his refusal or failure to complete the Work within the specified time.

Liquidated and actual damages for delay shall be paid by the CONTRACTOR or his Surety to the DEPARTMENT 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 his Surety shall be liable to the DEPARTMENT 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 DEPARTMENT 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 his Surety shall pay, all excess costs and expenses related to completion as provided by Article 14.2.5 in addition to these damages.

## **ARTICLE 12 - QUALITY ASSURANCE**

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

The CONTRACTOR warrants and guarantees to the DEPARTMENT 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 DEPARTMENT and the DEPARTMENT'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 therefore, 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 CONTRACTOR shall pay the cost of all inspections, tests and approvals that are required by the Contract Documents in addition to those above.. The DEPARTMENT may perform additional tests and inspections that 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 DEPARTMENT 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 DEPARTMENT 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 Final Completion 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 DEPARTMENT 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 DEPARTMENT 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 DEPARTMENT 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 Officer'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 will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and the DEPARTMENT shall be entitled to an appropriate decrease in the Contract Price. If the DEPARTMENT has already made final payment to the CONTRACTOR, the CONTRACTOR or his Surety shall pay an appropriate amount to the DEPARTMENT.

#### **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 DEPARTMENT 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 DEPARTMENT 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 DEPARTMENT has paid the CONTRACTOR but which are stored elsewhere. The CONTRACTOR shall allow the Contracting Officer and his 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 DEPARTMENT 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 DEPARTMENT 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 DEPARTMENT'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 or twice a month when requested by the CONTRACTOR, but only when the approved invoice exceeds \$10,000.00.

### **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 DEPARTMENT 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 DEPARTMENT'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 DEPARTMENT 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 DEPARTMENT 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 A Change Order has reduced the Contract Price,
- 13.7.3 The DEPARTMENT has been required to correct Defective Work or complete Work in accordance with paragraph 12.9.
- 13.7.4 The DEPARTMENT's actual knowledge of the occurrence of any of the events enumerated in paragraphs 14.2.1.a through 14.2.1.k inclusive.
- 13.7.5 Claims have been made against the DEPARTMENT or against the funds held by the DEPARTMENT on account of the CONTRACTOR's actions or inactions in performing this Contract, or there are other items entitling the DEPARTMENT 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 his obligations under any provision of this Contract.

### **13.8 Retainage:**

At any time the DEPARTMENT 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 DEPARTMENT, 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 Department of Labor, the CONTRACTOR shall provide a letter from the Department of Labor stating that withholding is no longer requested. Following such a submittal by the CONTRACTOR, the DEPARTMENT 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 DEPARTMENT 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 therefore. 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 DEPARTMENT 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 DEPARTMENT resulting from re-inspections, thereafter.

**13.11 Access Following Substantial Completion:**

The DEPARTMENT shall have the right to exclude the CONTRACTOR from the Work after the date of Substantial Completion, but the DEPARTMENT 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 DEPARTMENT 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 maintenance and operating instructions, schedules, guarantees, bonds, certificates of payment to all laborers, Subcontractors and Suppliers, certificates of inspection, marked-up record documents 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. All remaining certificates, warranties, guarantees, releases, affidavits shall accompany the final Application for Payment, 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 DEPARTMENT 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 DEPARTMENT 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 5.1, 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 DEPARTMENT 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 DEPARTMENT 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 materialmen in accordance with the Contract Documents shall be absolute. Neither any progress or final payment by the DEPARTMENT, nor the issuance of a certificate of Substantial Completion, nor any use or occupancy of the Work or any part thereof by the DEPARTMENT or Using Agency, nor any act of acceptance by the DEPARTMENT 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 DEPARTMENT 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.

**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 DEPARTMENT other than those previously made in writing and still unsettled.

**13.18 No Waiver of Legal Rights:**

The DEPARTMENT 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 therefore, 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 DEPARTMENT shall not be precluded or estopped, notwithstanding any such measurement, estimate, or certificate and payment in accordance therewith, from recovering from the CONTRACTOR or his Sureties, or both, such damages as it may sustain by reason of his failure to comply with requirements of the Contract Documents. Neither the acceptance by the DEPARTMENT, or any representative of the DEPARTMENT, 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 DEPARTMENT, 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 DEPARTMENT 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 DEPARTMENT 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 therefrom 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 If the CONTRACTOR:**

- a. Fails to begin the Work under the Contract within the time specified in the Proposal, or
  - b. Fails to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficiently skilled workmen, suitable materials or equipment or failure to adhere to the progress schedule established under paragraph 6.6 as revised from time to time), or
  - c. Performs the Work unsuitably or neglects or refuses to remove materials or to correct Defective Work, or
  - d. Discontinues the prosecution of the Work, or
  - e. Fails to resume Work which has been discontinued within a reasonable time after notice to do so, or
  - f. becomes insolvent, except that if the CONTRACTOR declares bankruptcy termination in accordance with all *U.S.C. 362* and/or *11 U.S.C. 365*. In the event the CONTRACTOR declares bankruptcy the CONTRACTOR agrees that the Contract will be assumed or rejected in a timely manner so that the Contract will be completed by the date specified in the Contract Documents, or
  - 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. For any cause whatsoever, fails to carry on the Work in an acceptable manner,
- the Contracting Officer may give notice in writing to the CONTRACTOR and his Surety of such delay, neglect, or default.

- 14.2.2 If the CONTRACTOR or Surety, within the time specified in the above notice of default, shall not proceed in accordance therewith, then the DEPARTMENT 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 DEPARTMENT 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 DEPARTMENT has paid the CONTRACTOR but which are stored elsewhere, and finish the Work as the DEPARTMENT may deem expedient. The DEPARTMENT 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.

- 14.2.3 The Contracting Officer may, by written notice to the CONTRACTOR and his Surety or his 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 his 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 DEPARTMENT 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.
- 14.2.4 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.
- 14.2.5 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 DEPARTMENT 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 DEPARTMENT and any amounts due to persons for whose benefit the DEPARTMENT has withheld funds, such excess shall be paid by the DEPARTMENT to the CONTRACTOR. If the damages, costs, and expenses due the DEPARTMENT exceed the unpaid balance, the CONTRACTOR and his Surety shall pay the difference.
- 14.2.6 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 DEPARTMENT, the termination will not affect any rights or remedies of the DEPARTMENT against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due the CONTRACTOR by the DEPARTMENT will not release the CONTRACTOR from liability.

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

- 14.4.1 The performance of the Work may be terminated by the DEPARTMENT 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 DEPARTMENT. Any such termination shall be effected by delivery to the CONTRACTOR of a *Notice of Termination*, specifying termination is for the convenience of the DEPARTMENT the extent to which performance of Work is terminated, and the date upon which such termination becomes effective.

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 he 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 that, if the Contract had been completed, would be required to be furnished to the DEPARTMENT;
- 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 DEPARTMENT has or may acquire any interest.

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

- 14.4.2 When the DEPARTMENT 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 DEPARTMENT - 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 DEPARTMENT 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 DEPARTMENT shall pay 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. Charges for loss of profit or consequential damages shall not be recoverable except as provided above.
- 14.4.3 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 his 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.
- 14.4.4 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.

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. The reasonable costs of settlement with respect to the terminated portion of the Contract heretofore, to the extent that these costs have not been covered under the payment provisions of the Contract.
- 14.4.5 The CONTRACTOR shall have the right of appeal under the DEPARTMENT's claim procedures, as defined in Article 15, for any determination made by the Contracting Officer, except if the CONTRACTOR has failed to submit his 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 DEPARTMENT 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 DEPARTMENT; and,
  - d. All progress payments made to the CONTRACTOR under the provisions of this section.
- 14.4.6 Where the Work has been terminated by the DEPARTMENT said termination shall not affect or terminate any of the rights of the DEPARTMENT against the CONTRACTOR or his Surety then existing or which may thereafter accrue because of such default. Any retention or payment of monies by the DEPARTMENT due to the CONTRACTOR under the terms of the Contract shall not release the CONTRACTOR or his Surety from liability.

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 DEPARTMENT 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 his Contract and relating to the Work terminated hereunder.

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

### **15.1 Notification:**

In addition to the notice requirements set out elsewhere in this Contract, if the CONTRACTOR becomes aware of any act or occurrence which may form the basis of a claim by the CONTRACTOR for additional compensation or an extension of time for performance, or if any dispute arises regarding a question of fact or interpretation of the Contract, the CONTRACTOR shall immediately inform the Project Manager. If the matter cannot be resolved by agreement within 7 days, the CONTRACTOR shall, within the next 14 days, submit an "Intent to Claim" in writing to the Project Manager.

The claim, if not resolved, shall be presented to the Project Manager, in writing, within 60 days following receipt of the "Intent to Claim". The Project Manager will acknowledge receipt of the claim in writing.

The CONTRACTOR agrees that unless these written notices are provided, the CONTRACTOR will have no entitlement to additional time or compensation for such act, event or condition. The CONTRACTOR shall in any case continue diligent performance of the Contract.

### **15.2 Presenting Claim:**

The claim shall specifically include the following:

- 15.2.1 The act, event or condition giving rise to the claim;
- 15.2.2 the Contract provisions that apply to the claim and under which relief is provided;
- 15.2.3 the item or items of Contract Work affected and how they are affected;
- 15.2.4 the specific relief requested, including Contract Time if applicable, and the basis upon which it was calculated.

### **15.3 Claim Validity, Additional Information, and Project Manager's Actions:**

The claim, in order to be valid, must not only show that the CONTRACTOR suffered damages or delay but that those conditions were actually a result of the act, event or condition complained of and that the Contract provides entitlement to relief to the CONTRACTOR for such act, event, or condition. The Project Manager reserves the right to make written request to the CONTRACTOR at any time for additional information which the CONTRACTOR may possess relative to the claim. The CONTRACTOR agrees to provide the Project Manager such additional information within 30 days of receipt of such a request. Failure to furnish such additional information may be regarded as a waiver of the claim. The Claim, if not resolved by agreement within 60 days of its receipt, will automatically be forwarded to the Contracting Officer for formal written decision.

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

The CONTRACTOR will be furnished the Contracting Officers decision within the next 90 days, unless the

Contracting Officer requests additional information. The Contracting Officer's decision is final and conclusive unless fraudulent as to the claim or unless, within 14 days of receipt of the decision, the CONTRACTOR delivers a written Notice of Appeal to the Appeals Officer. Procedures for appeals and hearings are covered under AS 36.30.625 and AS 36.30.630.

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STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

**REQUIRED CONTRACT PROVISIONS**  
**for**  
**FEDERAL-AID CONSTRUCTION CONTRACTS**

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**I. GENERAL**

1. These contract provisions shall apply to all work performed on the contract by the Contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

2. Except as otherwise provided in each section, the contractor shall insert in each subcontract all of the stipulations contained in these Required Contract Provisions and further require their inclusion in any lower tier subcontract or purchase order that may in turn be made. The Required Contract Provisions shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with these Required Contract Provisions.

3. A breach of any of the stipulations contained in these Required Contract Provisions shall be sufficient grounds for termination of the contract.

4. A breach of the following clauses of these Required Contract Provisions may also be grounds for debarment as provided in 29 CFR 5.12:

Section I, paragraph 2;  
Section IV, paragraphs 1, 2, 3, 4, and 7;  
Section V, paragraphs 1 and 2a through 2g.

5. Disputes arising out of the labor standards provisions of Section IV (except paragraph 5) and Section V of these Required Contract Provisions shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the U.S. Department of Labor (DOL) as set

forth in 29 CFR 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the DOL, or the contractor's employees or their representatives.

6. **Selection of Labor:** During the performance of this contract, the contractor shall not:

a. discriminate against labor from any other State, possession, or territory of the United States, or

b. employ convict labor for any purpose within the limits of the project unless it is labor performed by convicts who are on parole, supervised release, or probation.

**II. NON-DISCRIMINATION** (Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

1. **Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630 and 41 CFR 60) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The Equal Opportunity Construction Contract Specifications set forth under 41 CFR 60-4.3 and the provisions of the American Disabilities Act of 1990 (42 U.S.C. 12101 *et seq.*) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the State of Alaska, Department of Transportation and Public Facilities (DOT&PF) and the Federal Government in carrying out EEO obligations and in their review of his/her activities under the contract.

b. The contractor will accept as his operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: 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, pre-apprenticeship, and/or on-the-job training."

2. **EEO Officer:** The contractor will designate and make known to the DOT&PF contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active contractor

program of EEO and who must be assigned adequate authority and responsibility to do so.

3. **Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minority group employees.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. **Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minority groups in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The DOL has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)

c. The contractor will encourage his present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group applicants will be discussed with employees.

5. **Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.

6. **Training and Promotion:**

a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.

7. **Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female

employees. Actions by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:

a. The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.

b. The contractor will use best efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the DOT&PF and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The DOL has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the DOT&PF.

**8. Selection of Subcontractors, Procurement of Materials, and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment.

a. The contractor shall notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.

b. Disadvantaged business enterprises (DBE), as defined in 49 CFR 26, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of DBE construction firms from DOT&PF personnel.

c. The contractor will use his best efforts to ensure subcontractor compliance with their EEO obligations.

**9. Records and Reports:** The contractor shall keep such records as necessary to document compliance with

the EEO requirements. Such records shall be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the DOT&PF and the U.S. DOT.

a. The records kept by the contractor shall document the following:

(1) The number of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women;

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and

(4) The progress and efforts being made in securing the services of DBE subcontractors or subcontractors with meaningful minority and female representation among their employees.

b. The contractors will submit an annual report to the DOT&PF each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data.

**III. NONSEGREGATED FACILITIES** (Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

1. By submission of this bid, the execution of this contract or subcontract, or the consummation of this material supply agreement or purchase order, as appropriate, the bidder, Federal-aid construction contractor, subcontractor, material supplier, or vendor, as appropriate, certifies that the firm does not maintain or provide for its employees any segregated facilities at any of its establishments, and that the firm does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The firm agrees that a breach of this certification is a violation of the EEO Provisions of this contract. The firm further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability.

2. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, time clocks, 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 directive, or are, in fact, segregated on the basis of race, color, religion, or national origin, age or disability, because of habit, local custom, or otherwise. The only exception will be for the disabled when the demands for accessibility override (e.g. disabled parking).

3. The contractor agrees that it has obtained or will obtain identical certification from proposed subcontractors or material suppliers prior to the award of subcontracts or consummation of

material supply agreements of \$10,000 or more and that it will retain such certifications in its files.

#### **IV. PAYMENT OF PREDETERMINED MINIMUM WAGES**

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural minor collectors, which are exempt.)

##### **1. General:**

a. All mechanics and laborers 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 regulations (29 CFR 3) issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c) the full amounts of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) 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 be easily seen by the workers. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also for the purpose of this Section, 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 paragraphs 4 and 5 of this Section IV.

b. 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.

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

##### **2. Classification:**

a. The DOT&PF contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination,

shall be classified in conformance with the wage determination.

b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:

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

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

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

(4) with respect to helpers, when such a classification prevails in the area in which the work is performed.

c. If the contractor or subcontractors, as appropriate, the laborers and mechanics (if known) to be employed in the additional classification 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 U.S. Department of Labor, Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, D.C. 20210. The Wage and Hour 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.

d. In the event the contractor or subcontractors, as appropriate, the laborers or mechanics to be employed in the additional 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 Wage and Hour Administrator for determination. Said 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.

e. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 2c or 2d of this Section IV shall be paid to all workers performing work in the additional classification from the first day on which work is performed in the classification.

##### **3. Payment of Fringe Benefits:**

a. 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 or subcontractors, as appropriate 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.

b. If the contractor or subcontractor, as appropriate, does not make payments to a trustee or other third person, he/she 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.

#### **4. Apprentices and Trainees (Programs of the U. S. DOL) and Helpers:**

##### **a. Apprentices:**

(1) 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 DOL, 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/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.

(2) The allowable ratio of apprentices to journeyman-level employees 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 employee 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 listed in 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 or subcontractor 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-level hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

(3) 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 journeyman-level 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 for the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

(4) 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 or subcontractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the comparable work performed by regular employees until an acceptable program is approved.

##### **b. Trainees:**

(1) 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 DOL, Employment and Training Administration.

(2) The ratio of trainees to journeyman-level employees on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. 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.

(3) Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress, expressed as a percentage of the journeyman-level 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-level wage rate on the wage determination which provides for less than full fringe benefits for apprentices, in which case such trainees shall receive the same fringe benefits as apprentices.

(4) In the event the Employment and Training Administration withdraws approval of a training program, the contractor or subcontractor 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.

**c. Helpers:** Helpers will be permitted to work on a project if the helper classification is specified and defined on the applicable wage determination or is approved pursuant to the conformance procedure set forth in Section IV.2. Any worker listed on a payroll at a helper wage rate, who is not a helper under an approved definition, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed.

**5. Apprentices and Trainees (Programs of the U.S. DOT):** Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

**6. Withholding:** The DOT&PF shall, upon its own action or upon written request of an authorized representative of the DOL, withhold or cause to be withheld from the contractor or subcontractor 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, as 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 the work, all or part of the wages required by the contract, the DOT&PF contracting officer may, after written notice to the contractor, 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.

**7. Overtime Requirements:** No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such work week unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

**8. Violation: Liability for Unpaid Wages; Liquidated Damages:** In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible therefor shall be liable to the affected employee for his/her unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of \$10 for each calendar day on which such employee was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

**9. Withholding for Unpaid Wages and Liquidated Damages:** The DOT&PF shall, upon its own action or upon written request of an authorized representative of the U.S. 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 8 above.

## **V. STATEMENTS AND PAYROLLS**

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

**1. Compliance with Copeland Regulations (29 CFR 3):** The contractor shall comply with the Copeland

Regulations of the Secretary of Labor which are herein incorporated by reference.

### **2. Payrolls and Payroll Records:**

a. Payrolls and basic records relating thereto shall be maintained by the contractor and each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.

b. The payroll records shall contain the name, social security number, and address of each such employee, 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 Section 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, pursuant to Section IV, paragraph 3b, has found 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 and each subcontractor 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 cost anticipated or the actual cost incurred in providing benefits. Contractors or subcontractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees and ratios and wage rates prescribed in the applicable programs.

c. Each contractor and subcontractor shall furnish each week in which any contract work is performed to the DOT&PF resident engineer a payroll of wages paid each of its employees (including apprentices, trainees, and helpers described in Section IV, paragraphs 4 and 5 and watchmen and guards engaged on work during the preceding weekly payroll period). The payroll submitted shall set out accurately and completely all of the information required to be maintained under paragraph 2b of this Section V. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402 or the Government Bookstore, 915 Second Avenue, Seattle, WA 98174. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.

d. Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his/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 maintained under paragraph 2b of this Section V and that such information is correct and complete;

(2) that such laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid in 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 set forth in the Regulations, 29 CFR 3;

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

e. 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 2d of this Section V.

f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.

g. The contractor or subcontractor shall make the records required under paragraph 2b of this section V available for inspection, copying, or transcription by authorized representatives of the DOT&PF, the U.S. DOT, or the DOL, 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 DOT&PF, the U.S. DOT, DOL, or all may, after written notice to the contractor, sponsor, applicant, or owner, take such actions 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.

## **VI. RECORDS OF MATERIALS, SUPPLIES, AND LABOR** (Applicable to highway contracts)

1. On all Federal-aid contracts on the National Highway System, except those which provide solely for the installation of protective devices at railroad grade crossings, those which are constructed on a force account or direct labor basis, highway beautification contracts, and contracts for which the total final construction cost for roadway and bridge is less than \$1,000,000 (23 CFR Part 635) the contractor shall:

a. Become familiar with the list of specific materials and supplies contained in Form FHWA-47, "Statement of Materials and Labor Used by Contractor of Highway Construction Involving Federal Funds," prior to the commencement of work under this contract.

b. Maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed on Form FHWA-47, and in the units shown on the Form FHWA-47.

c. Furnish, upon the completion of the contract, to the DOT&PF resident engineer on Form FHWA-47 together with the data required in paragraph 1b relative to materials and supplies, a final labor summary of all contract work indicating the total hours worked and the total amount earned.

2. At the prime contractor's option, either a single report covering all contract work or separate reports for the contractor and for each subcontract shall be submitted.

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

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 State. Specialty items may be performed by subcontract and the amount of any such specialty items so 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 Part 635).

a. "Its own organization" shall be construed to include only workers employed and paid directly 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, assignee, or agent of the prime contractor.

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 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 this Section VII is computed includes the cost of materials 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 DOT&PF 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 DOT&PF 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 is assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

## **VIII. SAFETY: ACCIDENT PREVENTION**

1. In the performance of this contract, the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the DOT&PF contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract entered into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee in performance of the contract, to work in

surroundings or under conditions which are unsanitary, hazardous, or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

## **IX. FALSE STATEMENTS**

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. Title 18, United States Code, Section 1001, states:

**"Whoever, in any matter within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals or covers up by any trick, scheme, or device a material fact, or makes any false, fictitious or fraudulent statements or representations, or makes or uses any false writing or document knowing the same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than \$10,000 or imprisoned not more than five years, or both."** (June 25, 1948, ch. 645, 62 Stat. 749.)

To prevent any misunderstanding regarding the seriousness of these and similar acts, the following notice shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all personnel concerned with the project:

\* \* \* \* \*

### **NOTICE TO ALL PERSONNEL ENGAGED ON FEDERAL-AID HIGHWAY PROJECTS**

18 U.S.C. 1020, reads as follows:

**"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or**

**"Whoever knowingly makes any false statement, false representation, false report, or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or**

**"Whoever knowingly makes any false statement or false representation as to a material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916 (39 Stat. 355), as amended and supplemented;**

**"Shall be fined not more than \$10,000 or imprisoned not more than 5 years, or both."**

\* \* \* \* \*

## **X. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT**

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$100,000 or more.)

By submission of this bid, or the execution of this contract or subcontract, as appropriate, the bidder, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 *et seq.*, as amended by Pub. L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251, *et seq.*, as amended by Pub. L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR Part 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.

2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed there under.

3. That the firm shall promptly notify the DOT&PF of the receipt of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility that is or will be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.

4. That the firm agrees to include or cause to be included the requirements of paragraphs 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such requirements.

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

1. **Instructions for Certification - Primary Covered Transactions:** (Applicable to all Federal-aid contracts - 49 CFR 29)

a. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

d. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations.

f. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the non-procurement portion of the "Lists of Parties Excluded From Federal Procurement or Non-procurement

Programs" (Non-procurement List) which is compiled by the General Services Administration.

i. 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 clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph f of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

\*\*\*\*\*

**Certification Regarding Debarment,  
Suspension, Ineligibility and Voluntary  
Exclusion—Primary Covered Transactions**

1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

b. Have not within a 3-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1b of this certification; and

d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

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2. **Instructions for Certification - Lower Tier Covered Transactions:** (Applicable to all subcontracts, purchase orders and other lower tier transactions of \$25,000 or more - 49 CFR 29)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which

this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "primary covered transaction," "participant," "person," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

g. A participation in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Non-procurement List.

h. 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 clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

\* \* \* \* \*

#### **Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion—Lower Tier Covered Transactions:**

1. The prospective lower tier participant certifies, by submission of this proposal, 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.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

\* \* \* \* \*

#### **XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING** (Applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 - 49 CFR 20)

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. 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 Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

**SECTION 00800**  
**SUPPLEMENTARY CONDITIONS**  
**MODIFICATIONS TO THE GENERAL CONDITIONS**  
***(FEDERALLY FUNDED CONTRACTS)***

The following supplements modify, change, delete from, add to the "General Conditions of the Construction Contract for Buildings", revised December, 1987 ( c) 4/96. Where any article of the General Conditions is modified, or and Paragraph, Subparagraph, or Clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph, of Clause shall remain in effect.

Section 00750 – REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS are hereby added to Section 00700 – GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT FOR BUILDINGS. In the event of a conflict between provisions, the most stringent provision shall govern.

**SC-1-DEFINITIONS**

At General Conditions Article 1, add the following definitions:

**“APPROVED.** ‘Approved’ or ‘Approval’ as used in this contract document shall mean that the Department has received a document, form or submittal from the contractor and that the Department has taken “No exceptions” to the item submitted. Unless the context clearly indicates otherwise, approved or approval shall not mean that the Department 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 DEPARTMENT’S ENGINEER.

**ARCHITECT/ENGINEER.** Where used in the contract documents, “ARCHITECT/ENGINEER” shall mean the DEPARTMENT’S ENGINEER.

**ENGINEER.** The DEPARTMENT'S authorized representative of the Contracting Officer, as defined in the DEPARTMENT'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.

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

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

**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.

**LABORATORY.** The official testing laboratories of the DEPARTMENT 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.

**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.

**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.

**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.

**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."

At General Conditions Article 1, definition of **Conditions of the Contract**: Delete the text of this definition in its entirety.

At General Conditions Article 1, definition of **Contract Time**: Delete the text of this definition and replace with the following:

"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."

At General Conditions Article 1, definition of **Controlling Item**: Delete the text of this definition and replace with the following:

"Any feature of the Work on the critical path of a network schedule."

At General Conditions Article 1, definition of **Defective**: Delete the text of this definition and replace with the following:

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



At General Conditions Article 1, definition of **Effective Date of the Contract**: Delete the text of this definition in its entirety.

At General Conditions Article 1, definition **Shop Drawings**: Add the following text:

“Where used in the Contract Documents, “Shop Drawings” shall also mean “Submittals”.”

At General Conditions Article 1, second paragraph: Delete this paragraph in its entirety and replace with the following:

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

At General Conditions Article 1, third paragraph starting with “Whenever used in the Specifications...”, Delete this paragraph in its entirety.

At General Conditions Article 1, fourth paragraph, last sentence: Revise it to read as follows:

“Words defined in Article 1 are to be interpreted as defined.”

### **SC-2.1-AUTHORITIES AND LIMITATIONS**

At General Conditions Article 2.1.1, delete this paragraph in its entirety and replace with the following:

“The Contracting Officer alone, shall have the power to bind the DEPARTMENT 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 him. 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 DEPARTMENT 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. "

At General Conditions Article 2.1.4 starting with "The term of "Contracting Officer" when used...", delete this article in its entirety.

#### **SC-2.4-VISITS TO SITE/PLACE OF BUSINESS**

At General Conditions Article 2.4, delete this article in its entirety.

#### **SC-4.1-AVAILABILITY OF LANDS**

At General Conditions Article 4.1, add the following:

"The CONTRACTOR shall provide all waste and disposal areas, including disposal areas for hazardous or contaminated materials, at no additional cost to the DEPARTMENT."

#### **SC-4.7-SURVEY CONTROL**

At General Conditions Article 4.7, delete the third sentence and substitute the following text:

"Copies of all survey notes shall be provided to the DEPARTMENT at an interval determined by the Project Manager. The Project Manager may request submission on a weekly or longer period at his discretion. Any variations between the Contract Documents and actual field conditions shall be identified in the survey notes."

#### **SC-5.2-BONDS**

At General Condition Article 5.2, delete the second, third, fourth, fifth, and sixth paragraphs in their entirety.

#### **SC-5.4.2-INSURANCE REQUIREMENTS, GENERAL**

At General Condition Article 5.4.2, revise the first sentence to read as follows:

"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."

#### **SC-5.4.2a-WORKMANS COMPENSATION INSURANCE**

At General Condition Article 5.4.2a, replace paragraph "a" in its entirety and replace it 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, to include:
1. Waiver of subrogation against the 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 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."

### **SC-5.4b-COMPREHENSIVE GENERAL LIABILITY INSURANCE**

At General Conditions Article 5.4b, delete minimum limits of liability items 1 and 2 in their entirety and substitute the following text:

- “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

\$2,000,00 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 State of Alaska, DEPARTMENT of Transportation and Public Facilities shall be named as an “Additional Insured” under all liability coverages listed above.”

### **SC-5.4.2d-BUILDERS RISK INSURANCE**

At General Condition Article 5.4.2d, delete this subsection in entirety.

### **SC-5.4.3-INSURANCE REQUIREMENTS, EVIDENCE OF INSURANCE**

At General Conditions Article 5.4.3, delete this subsection and replace with the following:

"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 indemnity and as additional insured.

Evidence of insurance shall be furnished to the Department prior to the award of the contract. Such evidence, executed by the carrier's representative and issued to the Department, 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 Department 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)."

### **SC-6.6.1-PROGRESS SCHEDULE**

At General Condition Article 6.6.1, change the phrase "Within reasonable time prior to the Pre-Construction Conference..." to read:

"Prior to submitting the CONTRACTOR's first Application for Payment.".

### **SC-6.6.2-SCHEDULE OF SHOP DRAWINGS AND SCHEDULE OF VALUES**

At General Condition Article 6.6.2, change the phrase "Within fifteen days after the date of

the Notice To Proceed,..." to read:

"Prior to submitting the CONTRACTOR's first Application for Payment..."

#### **SC-6.9-SUBSTITUTES "OR EQUAL" ITEMS**

Add the following article:

"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."

#### **SC-6.13.1-SUBCONTRACT PROVISIONS**

At General Condition Article 6.13.1, delete the third sentence and add the following text:

"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."

#### **SC-6.27-LOAD RESTRICTIONS**

Add new General Conditions Article 6.27 as follows:

##### **"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 his equipment."

### **SC-7.2-PERMITS, LICENSES, AND TAXES**

At General Condition Article 7.2.1, add the following to the end of the first sentence:

"..., except for the permit from the State Fire Marshall's office for which the DEPARTMENT shall obtain and pay for. The contractor is responsible for pulling the permit and paying for any additional permits as required.

### **SC-7.12-APPLICABLE ALASKA PREFERENCES**

At General Condition Article 7.12, delete the text of this article in its entirety.

### **SC-7.13-PREFERENTIAL EMPLOYMENT**

At General Condition Article 7.13, delete the text of this article in its entirety.

### **SC-7.14.1-CERTIFIED PAYROLLS**

Add General Condition Article 7.14.3, as follows:

"Within three calendar days of award of a construction contract, the CONTRACTOR shall file a "Notice of Work" with the Department 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 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."

**SC-7.16-COVENANT AGAINST CONTINGENT FEES**

At General Conditions Article 7.16, delete the text of this article in its entirety.

**SC-7.17-OFFICIALS NOT TO BENEFIT**

At General Conditions Article 7.17, delete the text of this article in its entirety.

**SC-7.18-PERSONAL LIABILITY OF PUBLIC OFFICIALS**

At General Conditions Article 7.18, delete the text of this article in its entirety.

**SC-9.4-CHANGE ORDER**

At General Conditions Article 9.4, change the first sentence to read:

“A change in Contract Time, Contract Price, or responsibility may be made for changes within the scope of the Work by Change Order.”

At General Conditions Article 9.4, add the following sentence:

“A Change Order shall be considered executed when it is signed by the DEPARTMENT.”

**SC-9.10-INTERIM WORK AUTHORIZATION**

At General Conditions Article 9.10, add the following new paragraph:

**“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.”

#### **SC-10.3.2-CHANGE ORDER PRICE DETERMINATION FOR LUMP SUM CHANGE ORDERS**

At General Conditions Article 10.3.2, Delete this paragraph in its entirety and replace it with the following.

- “10.3.2 By mutual acceptance of a lump sum price which includes overhead and profit. The following maximum rates of cost markup (to cover both overhead and profit of the CONTRACTOR) shall be used in the negotiation of a Lump Sum Change Order:
- a. 15% - where a cost is borne directly by prime contractor.
  - b. 10% - where a cost is borne by a subcontractor”

#### **SC-10.4-COST OF THE WORK**

At General Conditions Article 10.4.1, replace the second sentence from the end of the paragraph with the following:

“Such employees shall include manual workers up through the level of foreman but shall not include general foremen, superintendents, and non-manual employees.”

At General Conditions Article 10.4.2, replace the first sentence with the following:

"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."

**SC-10.4.5.c-COST OF THE WORK (SUPPLEMENTAL COSTS)**

At General Condition Article 10.4.5.c, add the following:

"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 DEPARTMENT 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 his 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, 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."

### **SC-11.3-COMPUTATION OF CONTRACT TIME**

At General Condition Article 11.3.1, third sentence, change "...the date of Final Completion..." to:

"...the date of Substantial Completion..."

At General Condition Article 11.3.2, first sentence, change "...the date of Final Completion..." to:

"...the date of Substantial Completion."

Add General Condition Article 11.3.3, to state as follows:

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

### **SC-11.8-DELAY DAMAGES**

At General Condition Article 11.8, add the following:

"For each calendar day that the work remains incomplete after the expiration of the Contract Time, liquidated damages in the amount of **\$15,000.00 per calendar day** shall be assessed to the CONTRACTOR. If no money is due the CONTRACTOR, the DEPARTMENT shall have the right to recover said sum from the CONTRACTOR, the surety or both. The amount of these deductions is to reimburse the DEPARTMENT for estimated liquidated damages incurred as a result of the CONTRACTOR's failure to complete the work within the time specified. As liquidated damages, such deductions are not to be considered as penalties.

In addition to the delay damages for incomplete Work after the expiration of Contract Time, the following interim milestone delay damages shall be assessed to the CONTRACTOR:

Milestone 1 - \$500.00 per Calendar Day

Milestone 2 - \$250.00 per Calendar Day

Milestone 3 - \$250.00 per Calendar Day

Milestone 4 - \$400.00 per Calendar Day

Milestone 5 - \$500.00 per Calendar Day

Milestone 6 - \$350.00 per Calendar Day

Milestone 7 - \$400.00 per Calendar Day

Permitting the CONTRACTOR to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, will in no way operate as a waiver on the part of the DEPARTMENT of any of its rights under the Contract."

#### **SC 12-ONE YEAR CORRECTION PERIOD**

At General Condition Article 12.7, in the first sentence, change the phrase "Final Completion" to:

"Substantial Completion of the relevant portion of the Work..."

#### **SC 13.3-APPLICATION FOR PROGRESS PAYMENT**

At General Conditions Article 13.3, revise the last sentence to read as follows:

"Progress payments will be made as the Work progresses on a monthly basis."

#### **SC 13.13-FINAL COMPLETION AND APPLICATION FOR PAYMENT**

At General Conditions Article 13.13, first sentence, delete the following items:

“maintenance and operating instructions  
certificates of inspection  
marked up record documents”

The preceding items are some of the requirements for Substantial Completion, as addressed in Section 01701.

### **SC 13.16–CONTRACTOR’S CONTINUING OBLIGATION**

At General Condition Article 13.16, add the following paragraph:

“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.”

### **SC 14.2–DEFAULT OF CONTRACT**

At General Conditions Article 4.2, delete this section in its entirety and replace with the following:

- “14.2.1 The Contracting Officer may give the contractor and his 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 neglect or refuse 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 you declare bankruptcy, termination will be under Title 11 US Code 362 and/or 365. Your 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. are 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 Department 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 Department. The Department will provide you and your 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 Surety, within the time specified in the above notice of default, shall not proceed in accordance therewith, then the DEPARTMENT 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 DEPARTMENT 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 DEPARTMENT has paid the CONTRACTOR but which are stored elsewhere, and finish the Work as the DEPARTMENT may deem expedient. The DEPARTMENT 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 his Surety or his 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 his 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 DEPARTMENT 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 Department 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 Department may transfer the obligation to perform the work from the contractor to your surety. The surety must submit its plan for completion of the work, including any contracts or agreements with third parties for completion, to the Department 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 Department will make subsequent Contract payments directly to the Surety for work performed under the terms of the Contract. You forfeit any right to claim for the same work or any part thereof. You are not 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 therefor, 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 DEPARTMENT 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 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 DEPARTMENT and any amounts due to persons for whose benefit the DEPARTMENT has withheld funds, such excess shall be paid by the DEPARTMENT to the CONTRACTOR. If the damages, costs, and expenses due the DEPARTMENT exceed the unpaid balance, the CONTRACTOR and his 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 DEPARTMENT, the termination will not affect any rights or remedies of the DEPARTMENT against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due the CONTRACTOR by the DEPARTMENT will not release the CONTRACTOR from liability.

### **14.4 Convenience Termination:**

14.4.1 The performance of the Work may be terminated by the DEPARTMENT 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 DEPARTMENT. Any such termination shall be effected by delivery to the CONTRACTOR of a Notice of Termination, specifying termination is for the convenience of the DEPARTMENT 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 he 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 DEPARTMENT;

- 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 DEPARTMENT has or may acquire any interest.

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

14.4.3 When the DEPARTMENT 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 DEPARTMENT - 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 DEPARTMENT 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 DEPARTMENT. 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 his 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 your 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 you 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 you have 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 DEPARTMENT's claim procedures, as defined in Article 15, for any determination made by the Contracting Officer, except if the CONTRACTOR has failed to submit his 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 DEPARTMENT 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 DEPARTMENT; 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 DEPARTMENT said termination shall not affect or terminate any of the rights of the DEPARTMENT against the CONTRACTOR or his Surety then existing or which may thereafter accrue because of such default. Any retention or payment of monies by the DEPARTMENT due to the CONTRACTOR under the terms of the Contract shall not release the CONTRACTOR or his 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 DEPARTMENT 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 his 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 you, actually reflected in your contemporaneously maintained accounting or other financial records and supported by original source documentation.
- c. Cost Principles. The Department 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.”

## **SC-15-CLAIMS AND DISPUTES**

At General Conditions Article 15 – Claims and Disputes, delete this section in its entirety and substitute the following text:

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

#### **15.1 Notification**

15.1.1 The CONTRACTOR shall notify the DEPARTMENT 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 DEPARTMENT 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 DEPARTMENT 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 he basis his extension request, provide the DEPARTMENT 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 DEPARTMENT will not grant an extension of Contract Time if the CONTRACTOR does not timely submit revised schedules under **Section 01300**.

- 15.1.3 If the matter is not resolved by agreement within 7 days, the CONTRACTOR shall submit an Intent to Claim, in writing, to the DEPARTMENT 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 DEPARTMENT access to any such records and furnish the DEPARTMENT 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 Department 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 Department.
- 15.1.5 If the claim or dispute is not resolved by the DEPARTMENT, 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 acknowledge of the receipt of the Claim.
- 15.1.6 The CONTRACTOR waives any right to claim if the DEPARTMENT 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 DEPARTMENT can make written request to the CONTRACTOR at any time for additional information relative to the Claim. The CONTRACTOR shall provide the DEPARTMENT 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 Appeals 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 DEPARTMENT at any stage of prosecuting a claim under this Contract."

**END OF SECTION**



## SECTION 00850

### DRAWING INDEX

#### Drawings:

#### **Access Control System Replacement**

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**END OF SECTION**

## **SECTION 01010**

### **SUMMARY OF WORK**

#### **PART 1 GENERAL**

##### **1.01 REQUIREMENTS INCLUDED**

- A. Work Covered by Contract Documents.
- B. Work Sequence.
- C. Work by Others.
- D. Work Plans and Access to Facility, Individual Work Areas
- E. Hours of Operation
- F. Use of Premises.
- G. Coordination.
- H. Parking/Staging

##### **1.02 RELATED REQUIREMENTS**

- A. Document 00200 – Information available to bidders.
- B. Document 00700 - General Conditions: Provisions for use of site, and Using Agency occupancy. Relations of CONTRACTOR- Subcontractors.
- C. Document 00800 - Supplementary Conditions: Modifications to General Conditions.
- D. Section 01015 – Sequence of Work.
- E. Section 01540 – Security

##### **1.03 WORK COVERED BY CONTRACT DOCUMENTS**

- A. BASIC BID:
  - 1. PHASE ONE - Work of the basic bid as described by the contract documents includes but is not limited to: All Work as required to complete all product data and layout submittals, shop drawings, engineering calculations, implementation of electronic document management system, and conduct site investigations.

2. PHASE TWO - All Work not included in Phase One or Additive Alternate One as required to replace the existing campus wide access control system with a new enterprise access control system, including selected new portals and associated and ancillary work. Phase 2 Work shall also include the Work to be provided by the assigned subcontracts as further defined in Section 16749. Work of the assigned subcontractor shall be paid for by Change Order to the contract at the subcontractors current audited rates. The Contractor shall be allowed 10% overhead and 5% profit to be included in the Change Order for work performed by the assigned subcontractor.

- B. ADDITIVE ALTERNATE ONE – All Work associated with providing a redundant communications system for all DBC devices in accordance with Section 13710 - 2.4.

#### **1.04 WORK SEQUENCE**

- A. The Work shall be sequenced as described in Section 01015.

#### **1.05 CONTRACT METHOD**

- A. Construct the Work under a single lump sum Contract, including Cash Allowances.

#### **1.06 WORK BY OTHERS**

- A. Cooperate with other Contractors and the DEPARTMENT to minimize conflict with construction operations.

#### **1.07 WORK PLANS AND ACCESS TO FACILITY, INDIVIDUAL WORK AREAS**

- A. Provide detailed written work plan with sketch of each area impacted by the CONTRACTOR's work. The work plan shall be broken out into phases to localize impact of construction activities. Show limits of work enclosures, barricades, temporary partitions, or other items affecting the operation of the area. Work plan shall include a schedule for each major activity or trade.
- B. Prior to beginning work in new phase of work identified in the work plan, the CONTRACTOR shall notify the DEPARTMENT Project Engineer in writing at least 5 (five) working days, not including weekends or Holidays

#### **1.08 HOURS OF OPERATION**

- A. Construction operations may occur at any hour, any day.

#### **1.09 CONTRACTOR'S USE OF PREMISES**

- A. Coordinate use of the premises under direction of the DEPARTMENT.

- B. Assume full responsibility for protection and safekeeping of products under this Contract.
- C. Assume full responsibility for the protection of the existing adjacent property and contents, from damage due to construction operations.

#### **1.10 MATERIAL SAFETY DATA SHEETS**

- A. CONTRACTOR shall provide Material Safety Data Sheets for all volatile materials.

#### **1.11 COORDINATION**

- A. Coordinate Work of the various elements of the work plan to assure efficient and orderly sequence.

#### **1.12 PARKING / STAGING**

- A. CONTRACTOR parking is allowed in South and North Terminal employee parking lots, or public parking.
- B. Equipment staging areas if required shall be coordinated with the Department.

### **PART 2 PRODUCTS**

**Not Used**

### **PART 3 EXECUTION**

**Not used**

**END OF SECTION**

## **SECTION 01015**

### **SEQUENCE OF WORK**

#### **PART 1 GENERAL**

##### **1.01 REQUIREMENTS INCLUDED**

- A. Work Sequence.
- B. Coordination with Other Contractors.
- C. Schedule of Cutover.

##### **1.02 RELATED REQUIREMENTS**

- A. Document 13720 – ACS Sequencing and Cutover.
- B. Document 00700 - General Conditions: Provisions for use of site, and Using Agency occupancy. Relations of CONTRACTOR - Subcontractors.
- C. Document 00800 - Supplementary Conditions: Modifications to General Conditions.
- D. Section 01010 – Summary of Work.

##### **1.03 SEQUENCE OF WORK**

- A. The Work of the Contract shall be conducted and scheduled in a manner to minimize operational impacts to the Airport, the following Milestones and Notices-To-Proceed shall be used to sequence the Work accordingly. A Site Access Authorization will be issued to “kick-off” each milestone task.
  - 1. NTP 1: Shall authorize the Contractor access to the site for all Phase 1 Work.
  - 2. NTP 2: Shall authorize the Contractor to complete all Phase 2 Work not restricted by or within the work area of the South Terminal Seismic and Security Retrofit Project (PJ# 59016). Cutover of ACS portals shall be in accordance with the Cutover Schedule. Estimated date of NTP 2 is March 17, 2008.
  - 3. NTP 3: Shall authorize the Contractor to complete all Phase 2 Work within the area under the construction of PJ# 59016 with the exception of access to associated telecom rooms and ACS portal

cutover in this area. It is anticipated that NTP 3 will be issued on June 26, 2009.

4. NTP 3A: Shall authorize the Contractor to complete all Phase 2 Work within the area under the construction of PJ# 59016 with the exception of ACS portal cutover in this area. It is anticipated that NTP 3A will be issued on August 10, 2009.
5. NTP 4: Shall authorize the Contractor to complete all remaining Work within the area under construction of PJ# 59016. Upon issuance of NTP 4, the contractor responsible for the completion of PJ# 59016 (PCL Construction) shall turn over 15 portals every 10 days for completion under the terms of this contract. It is anticipated that NTP 4 will be issued on August 25, 2009.
6. Milestone 1: Shall include the completion, testing, and acceptance of all head-end equipment and systems necessary to operate and monitor the new access control system field devices. Milestone 1 shall be completed within 120 calendar days of NTP 2.
7. Milestone 2: Shall include the installation, testing, and cutover of the new ACS system at all portals of the ARFF building in accordance with the Contract documents. Work of Milestone 2 shall not commence until completion of Milestone 1 and shall be completed within 14 calendar days of Milestone 1.
8. Milestone 3: Shall include the installation, testing, and cutover of the new ACS system at all portals of the Field Maintenance Facility (FMF). Work of Milestone 3 shall not commence until completion of Milestone 2 and shall be completed within 25 calendar days of Milestone 2.
9. Milestone 4: Shall include the installation, testing, and cutover of the new ACS system at all portals of the North Terminal. Work of Milestone 4 shall not commence until completion of Milestone 3 and shall be completed within 105 calendar days of Milestone 3.
10. Milestone 5: Shall include the installation, testing, and cutover of the new ACS system at all portals of the South Terminal Concourse 'C'. Work of Milestone 5 shall not commence until completion of Milestone 4 and shall be completed within 200 calendar days of Milestone 4.
11. Milestone 6: Shall include the installation, testing, and cutover of the new ACS system at all portals of the South Terminal not affected by the Work of PJ# 59016. Work of Milestone 6 shall not commence until completion of Milestone 4 and shall be completed within 80 calendar days of Milestone 4.



12. Milestone 7: Shall include the installation, testing, and cutover of the new ACS system at all portals of the South Terminal that are partially completed by the Work of PJ# 59016. Milestone 7 shall be completed within 45 calendar days of issuance of NTP-4.
13. Milestone 8: Shall include the substantial completion of all Work of the Project, including remote gates. Milestone 8 shall be completed within 15 calendar days of Milestone 7.

#### **1.04 COORDINATION WITH OTHER CONTRACTORS**

- A. The Work of this Project will require coordination with the Contractor responsible for the construction of the South Terminal Seismic and Security Retrofit (PJ# 59016). Contractor shall be available to attend coordination meetings and adjust schedules as necessary to synchronize with the work of PJ# 59016. The Contractor shall make every reasonable effort to minimize conflicts between the projects.

#### **1.05 ACS SEQUENCING AND CUTOVER**

- A. The Contractor shall develop and adhere to a detailed cutover and sequencing plan approved by the Department in accordance with Section 13720.

### **PART 2 PRODUCTS**

**Not Used**

### **PART 3 EXECUTION**

**Not used**

**END OF SECTION**

## **SECTION 01027**

### **APPLICATIONS FOR PAYMENT**

#### **PART 1 GENERAL**

##### **1.01 REQUIREMENTS INCLUDED**

- A. Procedures for preparation and submittal of Applications for Payment.

##### **1.02 RELATED REQUIREMENTS**

- A. Document 00510 - Construction Contract - Contract Form 25D-10a and Bid Schedule: Method of Payment and Contract Price and Amounts of Liquidated Damages.
- B. Document 00700 - General Conditions: Progress Payments, and Final Payment.
- C. Section 00800 – Supplementary Conditions to General Conditions of the Construction Contract for Buildings: SC-11.2 and SC-11.8.
- D. Section 01300 - Submittals: Procedures, Schedule of Values .
- E. Section 01700 - Contract Closeout: Closeout Procedures.

##### **1.03 FORMAT**

- A. Application for Payment form in format approved by the DEPARTMENT.

##### **1.04 PREPARATION OF APPLICATIONS**

- A. Type required information on Application for Payment form approved by DEPARTMENT.
- B. Execute certification by original signature of authorized officer upon each copy of the Application for Payment.
- C. Submit names of individuals authorized to be responsible for information submitted on application for payment.
- D. Indicate breakdown of costs for each item of the Work on accepted schedule of values. Provide dollar value in each column for each line item for portion of Work performed and for stored products.

- E. 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.
- F. Prepare Application for Final Payment as specified in Section 01700.

#### **1.05 SUBMITTAL PROCEDURES**

- A. Submit two copies of each Application for Payment at times stipulated in Contract.
- B. Submit under transmittal letter specified in Section 01300.

#### **1.06 SUBSTANTIATING DATA**

- A. When DEPARTMENT requires substantiating information, submit data justifying line item amounts in question.
- B. Substantiating data required under 7.12.3 and 7.12.4 shall be submitted (or updated) when the Application for Payment includes a current request for payment on an item of Work required to include Alaska "agricultural/wood" products.
- C. Provide one copy of data with cover letter for each copy of Application. Show Application number and date, and line item by number and description.

#### **1.07 SUBMITTALS WITH APPLICATION FOR PAYMENT**

- A. Submit the following with each Application for Payment.
  - 1. Updated construction schedule as required by Section 01300 - Submittals.
  - 2. Updated Schedule of Values as required by Section 01300 – Submittals: Schedule of Values.

#### **PART 2 PRODUCTS**

**Not Used.**

#### **PART 3 EXECUTION**

**Not Used**

**END OF SECTION**



## **SECTION 01028**

### **CHANGE ORDER PROCEDURES**

#### **PART 1 GENERAL**

##### **1.01 REQUIREMENTS INCLUDED**

- A. Procedures for processing Change Orders.

##### **1.02 RELATED REQUIREMENTS**

- A. Document 00312 - Bid Schedule: Total amount bid for lump sum items
- B. Document 00510 - Contract Form: Total amount of Contract Price, as awarded
- C. Document 00700 - General Conditions: Governing requirements for changes in the Work, in Contract Price, and Contract Time.
- D. Document 00800 - Supplementary Conditions: Modifications to Document 00700 - General Conditions.
- E. Section 01027 - Applications for Payment.
- F. Section 01300 - Submittals: Construction Progress Schedules, Schedule of Values.
- G. Section 01700 – Contract Closeout: Project Record Documents.

##### **1.03 SUBMITTALS**

- A. Submit 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. Change Order Forms will be prepared by the DEPARTMENT.

#### **1.04 DOCUMENTATION OF CHANGE IN CONTRACT PRICE AND CONTRACT TIME**

- A. Maintain detailed records of work done on a Cost of the Work plus a Fee basis. Provide full information required for evaluation of proposed changes, and to substantiate costs of changes in the Work. Incomplete or unsubstantiated costs will be disallowed.
- B. CONTRACTOR shall submit a complete, detailed, itemized cost breakdown addressing impact on Contract Time and Contract Price with each proposal.
- C. On request, provide additional data to support computations:
  - 1. Quantities of products, labor, and equipment.
  - 2. Taxes, insurance and bonds.
  - 3. Overhead and profit.
  - 4. Justification for any change in Contract Time.
  - 5. Credit for deletions from Contract, similarly documented.
- D. Support each claim for additional costs, and for work done on a cost of the Work plus a Fee basis, with additional information:
  - 1. Origin and date of claim.
  - 2. Dates and times work was performed, and by whom.
  - 3. Time records and wage rates paid.
  - 4. Invoices and receipts for products, equipment, and subcontracts, similarly documented.

#### **1.05 PRELIMINARY PROCEDURES**

- A. DEPARTMENT may submit a Proposal Request which includes: Detailed description of change with supplementary or revised Drawings and Specifications, the projected time for executing the change, with a stipulation of any overtime work required, and the period of time during which the requested price will be considered valid.
- B. CONTRACTOR may initiate a change by submittal of a request to DEPARTMENT describing the proposed change with a statement of the

reason for the change, and the effect on Contract Price and Contract Time with full documentation.

#### **1.06 CONSTRUCTION CHANGE AUTHORIZATION**

- A. Shall be in accordance with Article 9 - Changes: in Document 00700 - General Conditions.

#### **1.07 FIXED PRICE CHANGE ORDER**

- A. CONTRACTOR shall submit an itemized price proposal in sufficient detail to fully explain the basis for the proposal. Attach invoices and receipts for products, equipment, subcontracts and as requested by the DEPARTMENT. CONTRACTOR and the DEPARTMENT shall then negotiate an equitable price (and time adjustment if appropriate) in good faith. The Change Order will reflect the results of those negotiations. If negotiations break down CONTRACTOR may be directed to perform the work under COST OF THE WORK CHANGE ORDER.

#### **1.08 UNIT PRICE CHANGE ORDER**

- A. For pre-determined Unit Prices and quantities, Change Order will be executed on a lump sum basis.
- B. For unit costs or quantities of units of Work which are not predetermined, execute Work under a Directive. Changes in Contract Price or Contract Time will be computed as specified for cost of the Work plus fee via Change Order.

#### **1.09 COST OF THE WORK CHANGE ORDER**

- A. CONTRACTOR shall submit documentation required in 1.04 on a daily basis for certification by the Project Manager. Project Manager will indicate by signature that the submitted documentation is acceptable.
- B. After completion of the change and within 14 Calendar Days, unless extended by the Project Manager, the CONTRACTOR shall submit in final form an itemized account with support data of all costs. Support data shall have been certified by the Project Manager, as required above in paragraph A.

### **1.10 EXECUTION OF CHANGE ORDERS**

- A. DEPARTMENT will issue Change Orders for signatures of parties as provided in Conditions of the Contract.

### **1.11 CORRELATION OF CONTRACTOR SUBMITTALS**

- A. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Price as shown on Change Order.
- B. Promptly revise progress schedules to reflect any change in Contract Time, revise subschedules to adjust times for other items of Work affected by the change, and resubmit.
- C. Promptly enter changes in project record documents.

## **PART 2 PRODUCTS**

**[Not Used]**

## **PART 3 EXECUTION**

**[Not Used]**

**END OF SECTION**



## **SECTION 01126**

### **CONTRACTOR'S CERTIFICATION OF SUBCONTRACTS**

#### **PART 1 GENERAL**

##### **1.01 REQUIREMENTS INCLUDED**

- A. Procedures for preparing, submitting and accepting subcontracts.

##### **1.02 RELATED REQUIREMENTS**

- A. Document 00100 - Instructions to Bidders, Requirements of Apparent Low Bidder
- B. Document 00430 - Subcontractor List
- C. Document 00700 - General Conditions: Paragraph 6.13.1, Subcontractor Certification and Approval
- D. Section 01300 - Submittals: Procedures

##### **1.03 PREPARATION OF CERTIFICATION**

- A. Certification Forms: Use only forms provided by DEPARTMENT.
- B. CONTRACTOR to prepare certification form in accordance with the instructions on the reverse side of form. Multiple subcontracts may be included under a single submittal. Where required, attach additional information -- cross referenced to the appropriate Subcontract -- to the certification form.
- C. Substitute certification forms will not be considered.

##### **1.04 SUBMITTAL OF CERTIFICATION**

- A. CONTRACTOR shall submit the initial and all subsequent certification form(s) in accordance with the submittal requirements identified under paragraph 1.02.D, previous.

##### **1.05 CONSIDERATION OF CERTIFICATION**

- A. Following receipt of submittal and within a reasonable period of time DEPARTMENT shall review for each of the following:
  - 1. Completeness of forms and attachments

2. Proper execution (signatures) of forms and attachments

- B. Submittals which are not complete or not properly executed will be returned to the CONTRACTOR under a transmittal letter denoting the deficiencies found. CONTRACTOR shall correct and resubmit per paragraph 1.04, previous.
- C. SUBCONTRACTORS WHICH HAVE NOT BEEN APPROVED BY THE DEPARTMENT SHALL NOT BE ALLOWED ON SITE.
- D. Payment will not be made for work performed by a non-certified subcontractor.

**1.06 ACKNOWLEDGEMENT OF CERTIFICATION**

- A. Submittals which have been examined by the DEPARTMENT and are determined to be complete and properly executed shall be acknowledged as such by the Department's project Manager on the approval line of the certification form.

**PART 2 PRODUCTS**

**Not Used**

**PART 3 EXECUTION**

**Not Used**

**END OF SECTION**

## **SECTION 01200**

### **PROJECT MEETINGS**

#### **PART 1 GENERAL**

##### **1.01 REQUIREMENTS INCLUDED**

- A. CONTRACTOR participation in preconstruction conferences.
- B. CONTRACTOR administration of progress meetings.

##### **1.02 RELATED REQUIREMENTS**

- A. Document 00120 - Supplementary Instructions to Bidders: Pre-Bid Conference.
- B. Section 01010 – Summary of Work: Coordination.
- C. Section 01300 - Submittals: Construction Progress Schedules, Shop drawings, Product data, and Samples.
- D. Section 01400 - Quality Control.
- E. Section 01700 - Contract Closeout: Project Record Documents, Operation and Maintenance Data.

##### **1.03 PRECONSTRUCTION CONFERENCES.**

- A. DEPARTMENT will administer preconstruction conference for execution of Contract and exchange of preliminary submittals and review of administrative procedures.
- B. Unless waived by mutual agreement, the DEPARTMENT will administer site mobilization conference at Project site for clarification of CONTRACTOR responsibilities in use of site and coordination with Using Agency for occupancy throughout the duration of the work. CONTRACTOR shall provide the detailed written work plan in preparation for this meeting.

##### **1.04 PROGRESS MEETINGS**

- A. Contractor shall schedule and administer weekly Project meetings throughout progress of the Work (unless this requirement is waived by the Project Manager), and other meetings as required to coordinate work.

- B. Attendance: Job superintendent, major Subcontractors and Suppliers; DEPARTMENT and Consultants as appropriate to agenda topics for each meeting.
- C. Minimum Required Agenda: Review of Work progress, status of progress schedule and adjustments thereto, Work anticipated in the next week, delivery schedules, submittals, maintenance of quality standards, pending changes and substitutions, and other items affecting progress of Work.

## **PART 2 PRODUCTS**

**Not Used**

## **PART 3 EXECUTION**

**Not Used**

**END OF SECTION**

## **SECTION 01300**

### **SUBMITTALS**

#### **PART 1 GENERAL**

##### **1.01 REQUIREMENTS INCLUDED**

- A. Procedures.
- B. Construction Progress Schedules.
- C. Schedule of Values.
- D. Shop Drawings, Product Data, and Samples.
- E. Field Samples.

##### **1.02 RELATED REQUIREMENTS**

- A. Section 01010 - Summary of Work.
- B. Section 01027 - Applications for Payment.
- C. Section 01400 - Quality Control.
- D. Section 01600 - Material and Equipment: Products List.
- E. Section 01700 - Contract Closeout: Closeout Procedures.

##### **1.03 PROCEDURES**

- A. Deliver submittals to DEPARTMENT as directed.
- B. Transmit each item under DEPARTMENT accepted form. Identify Project, CONTRACTOR, Subcontractor, major Supplier, identify pertinent Drawing sheet and detail number, and Specification section number, as appropriate. Identify deviations from Contract Documents by submitting a DEPARTMENT supplied Substitution Request Form. Provide a minimum of 8 1/2" x 5 1/2" blank space on the front page for CONTRACTOR, and Consultant review stamps.
- C. Submit initial progress schedules and Schedule of Values in five copies in accordance with paragraph SC6.6 of Document 00800 - Supplementary Conditions prior to submitting first Application for Payment. Form and content shall be reviewed by the DEPARTMENT. After review by

DEPARTMENT revise and resubmit as required. Submit subsequent updated schedules (10) days prior to each Application for Payment.

- D. Comply with progress schedule for submittals related to Work progress. Coordinate submittal of related items.
- E. After DEPARTMENT review of submittal, revise and resubmit as required, identifying changes made since previous submittal. Provide total number of submittals as required for the first submission, if 6 are required and 4 were returned for revisions, submit 6 again. The DEPARTMENT and Consultants will not return the first or revised copies of rejected submittals for re-use. DO NOT submit partial copies of submittals for incorporation into rejected submittal packages which have been kept by the DEPARTMENT and/or Consultants. Provide COMPLETE copies for each review.
- F. If drawings, product submittals, samples, mock-ups, or other required submittals are incomplete or not properly submitted, the DEPARTMENT will not review the submittal and will immediately return submittal to CONTRACTOR. DEPARTMENT will review a submittal no more than three times (incomplete or improper submittals count as one). CONTRACTOR shall pay all review costs associated with more than three reviews, unless a resubmittal is required due to new comments addressing previously submitted information.

#### 1.04 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit horizontal bar Gantt chart. Schedule shall show:
  - 1. Separate bar for each major trade or operation, identifying the duration of each activity and precedent activities.
  - 2. Complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Show each work plan and separate work area as a separate activity or group of activities.
  - 3. Submittal dates for required for Shop Drawings, product data, and samples, and product delivery dates, including those furnished by DEPARTMENT and those under allowances.
  - 4. All required submittals and indicating the date for each required submittal.
  - 5. Show projected percentages of completion for each item of Work and submittal as of time of each Application for Progress Payment. See below for electronic version requirements.

6. Submit Progress Schedule plotted on paper no larger than 24" x 36" and no smaller than 8 1/2" x 11" from the electronic program.
7. Submit Progress Schedule percentages in Tracking Gantt form plotted in format as stated above.

## 1.05 SCHEDULE OF VALUES

### A. FORMAT

1. Form and content must be acceptable to DEPARTMENT.
2. CONTRACTOR's standard form or media-driven printout will be considered on request.
3. Follow table of contents of Project manual for listing component parts. Identify each line item by number and title of listed Specification sections.

### B. CONTENT

1. List installed value of each major item of Work and each subcontracted item of Work as a separate line item to serve as a basis for computing values for progress payments. Round off values to nearest dollar.
2. For each major subcontract, list products and operations of that subcontract as separate line items.
3. Coordinate listings with progress schedule.
4. Component listings shall each include a directly proportional amount of CONTRACTOR's overhead and profit.
5. For items on which payments will be requested for stored products, list sub-values for cost of stored products with taxes paid.
6. Specific line item Values as indicated below shall be minimum acceptable amounts and must be included on all approved Schedules of Values and Applications for Payment.
  - a. **Section 01700 - Contract Closeout. Value of all required Substantial Completion Submittals and Closeout Submittals shall be not less than \$25,000 (twenty five thousand dollars).**
  - b. No progress payments will be made for Substantial Completion Submittals and Closeout Submittals until **all** submittals have been submitted to and accepted by the DEPARTMENT.



7. The sum of values listed shall equal total Contract Price.

**C. SUBMITTAL**

1. Submit four copies of Schedule prior to submitting the CONTRACTOR's first Application for Payment. Subsequent updated Schedule of Values shall be presented for review ten days prior to each Application for Payment.
2. Transmit under DEPARTMENT accepted form transmittal letter. Identify Project by DEPARTMENT title and Project number; identify Contract by DEPARTMENT Contract number.

**D. SUBSTANTIATING DATA**

1. When DEPARTMENT requires substantiating information, submit data justifying line item amounts in question.
2. 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**

## **SECTION 01305**

### **ELECTRONIC DOCUMENT MANAGEMENT SYSTEM**

#### **PART 1 - PART 1 – GENERAL**

##### **1.01 GENERAL PROJECT MANAGEMENT OBJECTIVES**

- A. This section contains general information that applies to all work performed under the Contract Documents.
- B. DOT/PF has contracted to use the Internet/Web-based project management software package Constructware® developed by Emerging Solutions, Inc. of Alpharetta, GA, to manage and track this project. The Contractor shall be required to create and/or respond to all requests for information (RFIs), submittals, transmittals, field authorizations, change order pricing, construction schedules, meeting minutes, correspondence, photos, certified payroll duplicates, etc. through the use of this software rather than by paper copies. Only documents requiring formal signatures shall be printed, and their hard copies signed and distributed. Support documentation in hard copy format for any document in Constructware® may be scanned into an electronic file and attached to the document in Constructware®.
- C. The Contractor shall be supplied with one (1) User license by DOT/PF. All additional licenses required to complete the Work shall be supplied by the Contractor.
- D. User licenses are temporary for the duration of the project, and may be reassigned to other Users during the project once the original User's company has completed their portion of the project.
- E. Use of this project management software will not replace or change any contractual responsibilities of the project team members.
- F. The administrator for all Constructware® User accounts is DOT/PF's Projects Coordinator. DOT/PF will provide instruction for licensed Users prior to commencement of the project, and shall provide local support for the Constructware® application. Emerging Solutions, Inc. in conjunction with AMC Engineers, Inc. will provide technical and backup support.
- G. Each User licensed by DOT/PF to use Constructware® shall have access to the Internet and an Internet e-mail address in order to communicate with various project team members. Immediately upon receipt of the Notice to Proceed, the Contractor shall provide confirmation of these conditions and the name, position, and e-mail address of the intended User to DOT/PF's Projects Coordinator.

- H. The Contractor shall inform all subcontractors of the purpose of the Constructware project management system and how it can assist them in obtaining information for the project. Any additional User licenses requested by the Contractor (for vendors, subcontractors, etc.) shall be paid for by the Contractor.
- I. Constructware® is intended to facilitate communication among the entire project team by maintaining a common real-time database of all of the projects records. Real-time message tracking and data reporting is available to any authorized project team member (licensed User) through any current Internet browser.
- J. Constructware® consists of separate modules or master file divisions for ease of organization. Available file divisions may include, but not be limited to (dependent upon User permission levels):
  - 1. Correspondence
  - 2. Daily Reports
  - 3. RFIs
  - 4. Transmittals
  - 5. Submittals
  - 6. Meetings
  - 7. Documents
  - 8. Drawings
  - 9. Specifications
  - 10. Punch Lists
  - 11. Reports
  - 12. Project Team
  - 13. Schedule of Values

#### 1.02 ACCESS, SOFTWARE, AND HARDWARE REQUIREMENT

- A. Access to the Internet portion of the project database will be provided 24 hours a day for all licensed Users involved with the project for the duration of their company's participation. Projects will be accessible through the [www.constructware.com](http://www.constructware.com) Web site via login names and passwords unique to Users on this project. During the bid period a test logon will be accessible to

review the system architecture. Company: amc\_anc\_acs. Logon ID: contractor.  
Password: password7.

- B. All costs associated with using the project database through Constructware®, including computer hardware and Internet service, are the responsibility of the Contractor.
- C. Software requirements are as follows:
  - 1. A 32-bit operating system such as Windows 95, 98, NT, 2000 or XP
  - 2. Internet Explorer Version 5.0, Service Pack 2, or above
- D. Hardware requirements are as follows:
  - 1. Pentium based (or equivalent) workstation or laptop.
  - 2. 32 megs of RAM minimum; ideally 128 megs of RAM
  - 3. A connection to the Internet (28.8 kbps or faster, 56 kbps recommended)

**PART 2 - MATERIALS**

**PART 3 - (NOT USED)**

**PART 4 - EXECUTION**

**PART 5 - (NOT USED)**

**END OF SECTION**

## **SECTION 01310**

### **PROGRESS SCHEDULES**

#### **PART 1 GENERAL**

##### **1.01 REQUIREMENTS INCLUDED**

- A. Procedures for preparation and submittal of construction progress schedules and periodical updating.

##### **1.02 RELATED REQUIREMENTS**

- A. Section 01010 – Summary of Work.
- B. Section 01015 – Sequencing.
- C. Section 01300 - Submittals: Shop Drawings, product data, and samples.
- E. Section 01127 – Applications for Payment.

##### **1.03 FORMAT**

- A. Prepare network analysis system using the critical path method, as outlined in The Associated General Contractors of America (AGC) publication "The Use of CPM in Construction - A Manual for General Contractors".
- B. Sequence of Listings: The chronological order of the start of each item of Work.
- D. Scale and Spacing: To provide space for notations and revisions.
- E. Sheet Size: 11"x17", multiple sheets as required.

##### **1.04 CONTENT**

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- B. Identify each item by Specification section number.
- C. Identify Work of separate stages or phases and other logically grouped activities.
- D. Provide sub-schedules for each stage of Work.
- E. Provide sub-schedules to define critical portions of entire schedule.

- F. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
- G. Provide separate schedule of submittal dates for Shop Drawings, product data, and samples, and dates reviewed submittals will be required from DEPARTMENT. Show decision dates for selection of finishes.
- H. Show delivery dates for progress critical equipment.
- I. Coordinate content with Section 01370 - Schedule of Values.

#### 1.05 REVISIONS TO SCHEDULES

- A. Indicate progress of each activity to date of submittal, and projected completion date of each activity.
- B. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.

#### 1.06 SUBMITTALS

- A. Submit initial schedules in accordance with paragraph SC6.6.1 of Document 00800 - Supplemental Conditions. After review, resubmit required revised data within seven calendar days.
- B. Submit one electronic copy in Microsoft Project 2003 format.

#### 1.07 DISTRIBUTION

- A. Distribute copies of reviewed schedules to job site file, Subcontractors, Suppliers, and other concerned entities.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

### PART 2 PRODUCTS

Not Used.

### PART 3 EXECUTION

Not Used.

END OF SECTION

## **SECTION 01400**

### **QUALITY CONTROL**

#### **PART 1 GENERAL**

##### **1.01 REQUIREMENTS INCLUDED**

- A. General Quality Control.
- B. Workmanship.
- C. Manufacturer's Instructions.
- D. Manufacturer's Certificates.

##### **1.02 RELATED REQUIREMENTS**

- A. Document 00700 - General Conditions: Inspection and testing required by governing authorities.
- B. Section 01010 – Summary of Work.
- C. Section 01300 - Submittals: Shop Drawings, Product Data, and Samples.

##### **1.03 QUALITY CONTROL, GENERAL**

- A. Maintain quality control over Suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

##### **1.04 WORKMANSHIP**

- A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.
- B. Perform Work by persons qualified to produce workmanship of specified quality.

##### **1.05 MANUFACTURERS' INSTRUCTIONS**

- A. Comply with instructions in full detail, including each step in sequence. Should instructions conflict with Contract Documents, request clarification from DEPARTMENT before proceeding.

## **1.06 MANUFACTURERS' CERTIFICATES**

- A. When required by individual Specifications section, submit manufacturer's certificate, in duplicate, that products meet or exceed specified requirements.

## **PART 2 PRODUCTS**

**Not Used**

## **PART 3 EXECUTION**

**Not Used**

**END OF SECTION**



**SECTION 01500**  
**CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS**

**PART 1 GENERAL**

**1.01 REQUIREMENTS INCLUDED**

- A. Electricity, Lighting.
- B. Heat, Ventilation.
- C. Telephone Service.
- D. Water.
- E. Sanitary Facilities.
- F. Dust Control (Exterior).
- G. Construction Enclosures.
- H. Barriers.
- J. Protection of Installed Work.
- K. Security.
- L. Water Control.
- M. Cleaning During Construction.
- N. Removal.
- M. Waste Storage Equipment.
- N. Cleaning of the Project Area.
- O. Disposal.

**1.02 RELATED REQUIREMENTS**

- A. Section 01010 - Summary of Work: Use of Premises.
- B. Section 01010 - Summary of Work: Shutoffs and Disruptions to Service.
- B. Section 01540 - Security.
- D. Section 01700 - Contract Closeout: Final cleaning.

### **1.03 ELECTRICITY, LIGHTING**

- A. Provide temporary power and lighting as required for construction operations.

### **1.04 HEAT, VENTILATION**

- A. If existing building heat and ventilation is inadequate for construction operations, provide as required.

### **1.05 TELEPHONE SERVICE**

- A. Provide telephone service if required for construction operations.

### **1.06 WATER**

- A. Provide all water required for construction operations.
- C. Hoses or temporary piping will not be permitted in public areas where a hazard to the public may be created.

### **1.07 SANITARY FACILITIES**

- A. Designated existing facilities within the terminal may be used during construction operations; maintain in clean sanitary condition. Do not use facilities for construction or cleaning of construction equipment.

### **1.08 DUST CONTROL**

- A. Execute Work by methods that minimize raising of dust or airborne debris from construction or demolition operations
- B. Provide positive means to prevent air-borne dust from dispersing into the atmosphere and onto the AOA. Sweep AOA of all debris left by demolition work.

### **1.09 CONSTRUCTION ENCLOSURES**

- A. Provide temporary enclosures/partitions around areas inside the facility that are affected by the construction.

### **1.10 BARRIERS**

- A. Provide as required to prevent public entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations.
- B. Provide barriers to provide both separation and safety to adjacent building occupants.

### **1.11 PROTECTION OF INSTALLED WORK**

- A. Contractor shall be solely responsible for the protection of installed work.

#### **1.12 SECURITY**

- A. Coordinate with DEPARTMENT security program, see SECTION 01540.

#### **1.13 WATER CONTROL**

- A. Direct water runoff to storm drain system, filter all water entering storm drain.

#### **1.14 CLEANING DURING CONSTRUCTION**

- A. In accordance with Part 2 and Part 3 of this specification.

#### **1.15 REMOVAL**

- A. Remove temporary materials, equipment, services, and construction prior to Substantial Completion inspection.
- B. Clean and repair damage caused by installation or use of temporary facilities.
- C. Restore existing facilities used during construction to specified, or to original, condition.

### **PART 2 PRODUCTS**

#### **2.01 WASTE STORAGE EQUIPMENT**

- A. Provide covered containers for deposit of materials, waste materials, debris, and rubbish.

### **PART 3 EXECUTION**

#### **3.01 CLEANING OF THE PROJECT AREA**

- A. Maintain all areas under CONTRACTOR's control free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

#### **3.02 DISPOSAL**

- A. Promptly remove waste materials, debris, and rubbish from site daily at end of workday and dispose of off site in accordance with all Federal, State and local regulations.

**END OF SECTION**

## **SECTION 01540**

### **SECURITY**

#### **PART 1 GENERAL**

##### **1.01 RELATED REQUIREMENTS**

- A. Section 01010 - Summary of Work.
- B. Section 01500 - Construction Facilities.

#### **PART 2 PRODUCTS**

**Not Used.**

#### **PART 3 EXECUTION**

##### **3.01 INTRODUCTION**

The following information will guide you through the security requirements and procedures at Ted Stevens Anchorage International Airport (ANC). ANC has assigned oversight for compliance with all procedures and requirements to Airport Operations. Departments within Airport Operations have specific responsibilities which are defined in greater detail below.

Note: critical contact phone numbers

Airport Operations: 266-2600

Airport Badge Office 266-2409

Airport Dispatch 266-2415

Due to the ever-changing nature of security requirements please contact the Airport Security Manager at 266-2522 for any clarification you may need.

##### **3.02 SECURITY PROGRAM**

- A. The Transportation Security Administration (TSA) requires ANC to control access and prevent unauthorized persons from entering Air Operations Areas (AOA). In compliance with this requirement, the airport operator has established procedures to authorize or deny access to the AOA and to identify and control persons while in these areas.

### 3.03 INSPECTIONS AND FINES

- A. The Contractor shall be liable for any fines levied against the State, by the TSA, resulting from actions of the Contractor, or those whom the Contractor is responsible for, that cause a failure in the maintaining of security in the area of construction, to include any points of entry into the Air Operations Area (AOA) utilized for the construction project. Failure to maintain security will also include failure to abide by the Airport badge identification program or other requirements pertaining to the security of the AOA.
- B. Contractor personnel are subject to random checks for compliance with the badging and permit regulations. These checks may be conducted by either Airport Police, Airport Operations, or the TSA.
- C. In order to maintain accountability for all Airport identification badges issued, the Contractor is responsible for physically collecting and returning to the Airport Badge Office all outstanding badges no longer used for the construction project. Proof of return is State Receipt issued by the Airport Badge Office.
- D. A non-refundable fine of \$300.00 will be levied against the Contractor for each badge not returned within five (5) days of badge expiration or completion of the project, whichever is sooner.
- E. Temporary ramp permits must be turned back into the Airport Badge Office within five (5) days of completion of work or expiration of the ramp permit(s), whichever is sooner. There is a non-refundable fine of \$50.00 for each permit not returned.
- F. Final payment to the contractor will be withheld pending the return of all badges and vehicle permits to the Airport Badge Office and the settlement of all charges due ANC Accounting.

### 3.04 AOA ENTRY CONTROL

- A. The Contractor is responsible for preventing unauthorized access to the AOA by way of the construction site. This includes maintaining ANC perimeter gates and doors in either a locked condition or attended by appropriately badged persons who ensure that only authorized personnel or vehicles are admitted through them into the AOA. Any opening of the AOA security fence requires prior coordination with Airport Operations. Contact Airport Operations at 266-2600.
- B. Those persons designated to control access points into the AOA shall be instructed by Airport Operations in the proper procedures of identification requirements for persons and vehicles. These procedures are specific to each contract and may change during different phases of the contract.
- C. The Contractor will provide these persons with the capability to communicate directly with Airport Operations and Airport Dispatch.

- D. The Contractor will be responsible for maintaining, as a minimum, a six (6) foot clear zone on both sides of any perimeter fence line affected by the Contractor or any authorized representative.

### **3.05 AIRPORT IDENTIFICATION BADGES**

- A. The Airport Identification Badge, developed and adopted by ANC, is the only identification system recognized as authority to enter the Security Identification Display Area (SIDA) and Sterile Areas of the airport. Only persons identified by this system are permitted access. All Airport Identification Badges must be worn on the outermost garment above the waist.
- B. Any person found in the SIDA or Sterile Area, not in compliance with this program, will be removed from the area and action will be taken against violators as appropriate under Alaska State Statute or Alaska Administrative Code.
- C. Airport issued Identification Badges are not required outside the SIDA and Sterile Areas, unless specifically stated by Airport Operations. For leaseholds outside the SIDA, but within the AOA, ANC may approve the use of a valid driver's license or company identification cards issued from a person's employer. This authorization shall be discussed and approved by Airport Operations or the Airport Security Manager prior to beginning of a project.
- D. Control Authority
1. ANC has delegated authority for approving issuance, system control, implementation, and accountability of this program to the Airport Badge Office.
  2. An individually - assigned Airport Identification Badge will be used by each Contractor employee granted access to the airport SIDA, Sterile Area or other airport restricted areas for construction projects. It does not grant access to aircraft and is valid only for the area in which their construction is actually taking place and the approved routes to and from that area.

### **3.06 BADGE ISSUE PROCEDURES**

- A. All fingerprint, security threat assessment (STA) and badge requests must be authorized through the Project Manager. Detailed instructions and applicable paperwork will be given to the Project Manager and the contractor prior to requests being submitted to the Badge Office.

#### **Badge Office general information**

1. Office Location: 6040 DeHaviland Avenue, next to the Airport Police and Fire Building and across the street from the Post Office on Postmark Drive.
2. Office hours: Monday through Friday from 7:00 a.m. to 4:00 p.m. Closed holidays.
3. Contact phone number: 907-266-2409

4. Security and Ramp Driver's Training: Monday through Friday at 8:00 a.m. for walk-ins and groups of 3 or fewer individuals. Larger groups may be scheduled through the Badge Office for Tuesday or Thursday at 1:00 p.m. It is advised that you check in for training 30 minutes prior to the scheduled class time as class size is limited.
5. The fingerprinting fee is \$30.00 and badge fee is \$30.00. Payment is required at time of service for each. All fees shall be paid by the Contractor as an incidental cost.

B. Badging is a two step process.

1. The first step is that each person requiring an Airport Identification Badge must submit to a FBI fingerprint based Criminal History Records Check (CHRC) and a STA. If the CHRC shows no TSA disqualifying criminal offense within the preceding ten years from the date of fingerprint submission and the TSA clears the individual for the STA, the Project Manager is notified and the person may proceed to step two. Allow one to two weeks for this process to take place.
  2. Step two is the Security and Ramp Driver Training and badge issuance. This training is available at the Airport Badge Office, see the times above. The actual training takes approximately 30 minutes for badge requests without a Ramp Driver's License and 60 minutes for those individuals requesting a Ramp Driver's License and, or Escort Authorization. Individuals requesting a Ramp Driver's License will be required to pass a written test. Upon successful completion of step two, an Airport Identification Badge may be issued.
- C. In lieu of an Airport Identification Badge, for those employees working in the same area together, there needs to be only one employee with an Airport Identification Badge, with Escort Authorization, while the other employees in the area may be issued a visitor badge. Note: there must be an Airport I.D. Badged employee monitoring them at all times. This person must have Escort Authority indicated on their badge. A person using a visitor badge is not required to view the training video, but is expected to follow all regulations while on the restricted areas of the airport.
- D. Any falsifications can result in revocation of the badges for the individual in question, and any fines incurred from the violations will be passed to the responsible party.
- E. Request letters will be considered valid for 30 days from the date they are originally signed and dated.
- G. Upon issuing an Airport Identification Badge, each badged employee will be issued a set of airport rules and regulations they shall be held responsible for while working in restricted areas of the airport.

- H. An Alaska Public Safety Information Network records check may be made on the employee, to include checking current driver's license status for ramp license requests.
- I. The Contractor shall be responsible for the maintenance of records necessary to ensure the retrieval of badges from employees and subcontractor(s).
  - 1. Whenever a badged person's employment authorized by the Contractor is terminated, the Contractor is responsible for immediately recovering the ID badge and returning it to Airport Badge and Vehicle Permit Office within five (5) days of an employee's termination date or the completion of the project, whichever is sooner.
  - 2. When someone terminates employment, the Contractor shall immediately notify the Airport Badge Office so the badge can be deactivated. If termination is outside of the normal working hours, the Contractor shall immediately notify Airport Dispatch at 266-2415 of the termination.
- J. Should an employee lose his or her I.D. Badge, they should immediately notify their employer, who shall then immediately notify the Airport Badge Office. If lost after normal business hours, then it should be reported to Airport Dispatch. The Badge Office will confirm the employee's employment status prior to reactivation of a badge reported lost, then found by the owner. If requested, a replacement badge will not be issued until a replacement request letter is received and the \$50.00 lost badge fee is paid. This is a separate fee from the non-refundable fine of \$300.00 applied to non-returned badges. If a replacement badge is issued for a lost badge, and the \$50.00 fee paid, the Contractor will not be charged the non-refundable fine of \$300.00.
- K. The Airport Operator requires each Contractor and badge holder to agree to abide by the provisions of this identification program. The Contractor shall designate one or more persons to act as the authorized point of contact for coordination in matters of badge program administration and security.

### **3.07 VEHICLE ACCESS ON AOA**

- A. As stated previously, the TSA requires the Airport Operator to control access into and prevent unauthorized vehicles from entering the AOA. In compliance with this requirement, the Airport Operator has established procedures to authorize or deny access to the AOA and to identify and control vehicles while within the AOA.
- B. Proper individual identification, ramp driver's licenses, and vehicle permits must be obtained through Airport Badge Office before attempting to enter the AOA.

### **3.08 VEHICLE IDENTIFICATION STANDARDS**

- A. All Contractor vehicles requiring access to the AOA shall display a company logo and temporary ramp permit as issued and instructed by Airport Badge Office. All permit requests must come through and be authorized by the Project Manager.



### **3.09 AREA OF AUTHORIZATION**

- A. Contractor vehicles are only authorized in the areas where their contract work is being performed and on the access routes to and from that area.

### **3.10 AUTHORIZED VEHICLES**

- A. Contractor vehicles are authorized onto the AOA only when within it's area of authorization, the temporary ramp permit is properly displayed, and all occupants have the required airport identification properly displayed.

**END OF SECTION**

## **SECTION 01600**

### **MATERIAL AND EQUIPMENT**

#### **PART 1 GENERAL**

##### **1.1 REQUIREMENTS INCLUDED**

- A. Products.
- B. Transportation and Handling.
- C. Storage and Protection.
- D. Product Options.
- E. Products List.
- F. Substitutions.

##### **1.2 RELATED REQUIREMENTS**

- A. Section 01010 - Summary of Work.
- B. Section 01400 - Quality Control: Manufacturers' Certificates.
- C. Section 01700 – Contract Closeout

##### **1.3 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.

##### **1.4 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.

## 1.5 STORAGE AND PROTECTION

- A. **HANDLE AND STORE MATERIALS FOR CONSTRUCTION, PRODUCTS OF DEMOLITION, AND OTHER ITEMS TO AVOID DAMAGE TO TERMINAL BUILDING, AIRCRAFT, AND OTHER AIRPORT RELATED VEHICLES AND EQUIPMENT.**
- 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. Arrange storage to provide access for inspection. Periodically inspect to assure products are undamaged, and are maintained under required conditions.
- D. Provide Material Safety Data Sheets (MSDS) for all products which may produce unpleasant or noxious odors. CONTRACTOR shall provide for adequate venting if needed.

## 1.6 OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards.
- B. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions by meeting product description: Submit a request for substitution for any manufacturer not specifically named that meets the product description specifications.
- C. Products Specified by Naming One or More Manufacturers followed by the term "No Substitutions": Use only specified manufacturers, no substitutions allowed.

**PART 2 PRODUCTS**

**Not Used**

**PART 3 EXECUTION**

**Not Used**

**END OF SECTION**

## **SECTION 01630**

### **SUBSTITUTIONS AND PRODUCT OPTIONS**

#### **PART 1 - GENERAL**

##### **1.01 REQUIREMENTS INCLUDED**

- A. CONTRACTOR's options in selection of products.
- B. Products list.
- C. Requests for substitution of products.

##### **1.02 RELATED REQUIREMENTS**

- A. Document 01600 – Material and Equipment: Substitutions
- B. Document 00700 - General Conditions: Substitutes or "Or-Equal" Items.
- C. Document 00800 - Supplementary Conditions: Substitutions
- D. Section 01010 - Summary of Work: Coordination of Construction.
- E. Section 01300 – Submittals.
- F. Section 01700 – Contract Closeout Procedures: Project Record Documents.

##### **1.03 SUBSTITUTION SUBMITTAL PERIOD**

- A. All product substitution requests will be considered only within 30 days after date established in Notice to Proceed. Subsequent requests will be considered only in case of product unavailability or other conditions beyond control of CONTRACTOR.

##### **1.04 OPTIONS**

- A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards.
- B. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not specifically named.

- C. Products Specified by Naming One or More Manufacturers followed by the term "No Substitutions": use only specified manufacturers, no substitutions allowed.

#### **1.05 PRODUCT SUBSTITUTIONS LIST**

- A. Within 21 days after date of Notice to Proceed, transmit four copies of a list of product substitutions which are proposed for installation, including name of manufacturer.

#### **1.06 LIMITATIONS ON SUBSTITUTIONS**

- A. Substitutions will not be considered when indicated on Shop Drawings or product data submittals.
- B. Substitute products shall not be ordered or installed without written acceptance.
- C. DEPARTMENT will determine acceptability of substitutions.

#### **1.07 REQUESTS FOR SUBSTITUTIONS**

- A. Submit separate request for each substitution. Document each request with complete data substantiating compliance of proposed substitution with requirements of Contract Documents.
- B. Identify product by Specification section and Article numbers. Provide manufacturer's name and address, trade name of product, and model or catalog number. List fabricators and Suppliers as appropriate.
- C. Attach product data as specified in Section 01300.
- D. List similar projects using product, dates of installation, and names of design Consultant(s) and owner.
- E. Give itemized comparison of proposed substitution with specified product, listing variations, and reference to Specification sections and Article numbers.
- F. Give quality and performance comparison between proposed substitution and the specified product.
- G. Give cost data comparing proposed substitution with specified product, and amount of net change to Contract Price.

- H. List availability of maintenance services and replacement materials.
- I. State effect of substitution on construction schedule, and changes required in other Work or products.

#### **1.08 CONTRACTOR REPRESENTATION**

- A. Request for substitution constitutes a representation that CONTRACTOR has investigated proposed product and has determined that it is equal to or superior in all respects to specified product.
- B. CONTRACTOR will provide same warranty for substitution as for specified product.
- C. CONTRACTOR will coordinate installation of accepted substitute, making such changes as may be required for Work to be complete in all respects.
- D. CONTRACTOR certifies that cost data presented is complete and includes all related costs under this Contract.
- E. CONTRACTOR waives claims for additional costs related to substitution which may later become apparent.

#### **1.09 SUBMITTAL PROCEDURES**

- A. Submit electronic copies of complete request for substitution via the EDMS.
- B. DEPARTMENT will review CONTRACTOR's requests for substitutions with reasonable promptness.
- C. During the bidding period, DEPARTMENT will record acceptable substitutions in Addenda.
- D. After Award of Contract, DEPARTMENT will notify CONTRACTOR, in writing, of decision to accept or reject requested substitution within 15 days.
- E. For accepted products, submit Shop Drawings, product data, and samples under provisions of Section 01300.

### **PART 2 - PRODUCTS**

**[Not Used]**

**PART 3 - EXECUTION**

**[Not Used]**

**END OF SECTION**



## **SECTION 01650**

### **COMMISSIONING REQUIREMENTS**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

- A. This Section outlines general commissioning requirements for equipment and systems specified under Divisions 13 and 16. The Access Control System specified under Section 13710 shall be commissioned as specified under Division 16.
- B. Related Requirements
  - 1. Section 00800 - Supplementary Conditions
  - 2. Section 01015 – Sequence of Work
  - 3. Section 01200 – Project Meetings
  - 4. Section 01300 - Submittals
  - 5. Section 01310 – Progress Schedules
  - 6. Section 01700 - Contract Closeout
  - 7. Sections 13710 - Access Control System
  - 8. Section 16010 - Electrical General Requirements
  - 9. Section 16995 - Electrical Commissioning
  - 10. Section 16997 – Electrical Functional Performance Testing Requirements
  - 11. Section 16998 – Electrical Prefunctional Installation Examination Requirements

##### **1.2 DESCRIPTION**

- A. Commissioning
  - 1. Commissioning is a systematic process of ensuring that building systems perform interactively according to the design intent and the owner's operational needs.
  - 2. Commissioning during the construction phase is intended to achieve the following specific objectives according to the Contract Documents:
    - a. Verify that applicable equipment and systems are installed according to the manufacturer's recommendations and to industry accepted minimum standards and that they receive operational checkout by installing contractors in accordance with the specifications.
    - b. Verify and document proper performance of equipment and systems.
    - c. Verify that O&M documentation left on site is complete.
    - d. Verify that the Owner's operating personnel are trained per specification requirements.
  - 3. The commissioning process does not reduce the responsibility of the installing contractors to provide a finished and fully functioning product.

B. Commissioning shall include the following:

1. Compile and submit for approval the Commissioning Master Equipment and System List. Maintain and update the list throughout the project to accurately reflect commissioning activity.
2. Compile and submit for approval Prefunctional Installation Examination Checklist Forms.
3. Compile and submit for approval Functional Performance Test Checklist Forms.
4. Compile and submit for approval the Submittal Schedule in accordance with Section 01300. Ensure that the items on the schedule are submitted on time.
5. Summarize all training requirements and submit for approval syllabuses for all training, coordinating with the DEPARTMENT for training schedules and locations. Verify that all training has been completed as scheduled.
6. Coordinate Prefunctional Installation Examinations for each piece of equipment requiring commissioning. Verify that checklist forms are completed and submitted for all equipment.
7. Verify submittal and acceptance of all Test Reports and Certifications required for equipment and systems. Refer to the technical specifications for specific submittal requirements.
8. Coordinate Functional Performance Tests for each piece of equipment and system requiring functional testing.
9. Verify submittal and acceptance of O&M manuals.

C. Phased Commissioning: Commissioning Activities shall be coordinated with the sequence of work as outlined in Section 01015 Sequence of Work.

### 1.3 REFERENCES

- A. ASHRAE Guideline 1-1996, Guideline for Commissioning of HVAC Systems. A copy may be purchased by calling ASHRAE Publication Sales at (404) 636-8400.
- B. Model Commissioning Plan and Guide Specifications Version 2.05 - 1998, US Department of Energy - <http://www.peci.org/cx/mcpgs.html> or <http://www.eren.doe.gov/femp/techassist/bldgcomgd.html>.

## 1.4 DEFINITIONS

- A. **Functional Performance Test (FT)** - Test of the dynamic function and operation of equipment and systems using manual (direct observation) or monitoring methods. Functional testing is the dynamic testing of systems (rather than just components) under full operation (e.g., the access control system is tested interactively with the CCTV and Intercom Systems to verify that proper associated video is called up and an intercom channel enabled if applicable). Systems are tested under various modes, such as during fire alarm, power failure, etc. The systems are run through all the access control system's sequences of operation and components are verified to be responding as the sequences require. The Contractor shall develop the functional test procedures in a sequential written form, then coordinate, oversee and document the actual testing, which is usually performed under the Division of the Specifications in which the Work is specified. FTs are performed after prefunctional checklists and startups are complete.
- B. **Phased Commissioning** - Commissioning that is completed in phases (by floors or area, for example) due to the size of the structure or other scheduling issues, in order minimize the total construction time.
- C. **Prefunctional Installation Examination Checklist (PC)** - A list of items to inspect and elementary component tests to conduct to verify proper installation of equipment. Prefunctional checklists are primarily static inspections and procedures to prepare the equipment or system for initial operation (e.g., door hardware properly installed, wiring properly terminated, wire tags installed, etc.). However, some prefunctional checklist items entail simple testing of the function of a component, a piece of equipment or system (such as verifying operation of door hardware). The word prefunctional refers to before functional testing. Prefunctional checklists augment and are combined with the manufacturer's start-up checklist. Even without a commissioning process, contractors typically perform some, if not many, of the prefunctional checklist items required under commissioning. However, few contractors document in writing the execution of these checklist items. Therefore, for most equipment, the contractors execute the checklists on their own. The CCR and DEPARTMENT field verify that the prefunctional checks take place. For larger or more critical pieces of equipment the CCR and DEPARTMENT may elect to witness execution of the checklists.
- D. **Commissioning Master Equipment and System List:** A tabulated list of ALL equipment and systems that are required to be commissioned as identified in the technical specifications. The list summarizes all commissioning activities required for each item on the list.

## 1.5 SUBMITTALS

A. Organization of Submittals:

1. Bind material in 8-1/2 by 11 inch three-hole loose-leaf binders by individual sets. Do not overload binders.
2. Arrange material in Specification order. Separate each item with a labeled tab. Provide an index of the contents in the front of each binder.

B. Within 60 day of NTP submit:

1. The names, qualifications, and phone number of the Contractor's Commissioning Team.

C. Within 90 days of NTP submit:

1. Preliminary Commissioning Master Equipment and System List for approval.
2. Preliminary Prefunctional Installation Examination Checklist Forms for review for all equipment and systems that require commissioning.
3. Preliminary Functional Performance Testing Checklist Forms for review for all equipment and systems that require functional testing as part of commissioning.
4. List of System Training requirements.

D. Submittal Schedule in accordance with Section 01300.

E. Final Commissioning Master Equipment and System List within 30 days of acceptance of Finalized CPM Schedule. Refer to Section 01310.

F. Within 60 days of acceptance of product submittals for Divisions 13 and 16 submit:

1. Final Prefunctional Installation Examination Checklist Forms for all equipment and systems that require commissioning for approval. Include manufacturer's installation instructions and startup checklists as an attachment for each form.
2. Final Functional Performance Testing Checklist Forms for all equipment and systems that require functional testing as part of commissioning for approval.

G. Completed Prefunctional Installation Examination Checklist Forms as work progresses.

H. Completed Functional Checkout Checklists as work progresses.

I. Updated Commissioning Master Equipment and System List monthly.

J. System training syllabuses for each system that has training requirements, 60 days before training is scheduled to begin.

**K. Project Closeout**

1. Completed Schedule of Equipment and Systems to be Commissioned showing all items completed.
2. Certificate of completion.

**1.6 QUALITY ASSURANCE**

**A. Commissioning Team:**

1. Assemble a commissioning team that has primary responsibility for assuring that the commissioning process is completed successfully.
2. The team shall consist of
  - a. Contractor's Commissioning Representative. The Contractor's Commissioning Representative (CCR) shall have a minimum of 5 years of experience in electrical system design and installation. The individual shall have a working understanding of all system types included in the work of this contract. The individual shall have experience supervising others, reading drawings and specifications, and inspecting construction work. The individual shall have good communication and problem solving skills, and a knowledge of local conditions. The CCR shall be an employee of the General Contractor whose prime responsibility shall be Commissioning.
3. Commissioning Representatives from each discipline that will be responsible for overseeing commissioning activity. Submit the name, title, discipline, role in the commissioning process, and responsibilities for each team member. Refer to Section 16995 for Electrical Commissioning Representative requirements.
4. Submit qualifications resume of the CCR and each of the Commissioning Representatives. Refer to Section 16995 for additional requirements.

**B. Pre-construction Commissioning Meetings**

1. Convene a Pre-Construction Commissioning meeting within 60 days of NTP. The purpose of the meeting shall be:
  - a. Review the duties and responsibilities of the Commissioning team.
  - b. Review the requirements of the submittal process with all members of the Contractor's Commissioning team.
  - c. Establish initial schedule for submittals required under this Section.
2. The Commissioning Team shall be present.
3. Representatives of the DEPARTMENT shall be present during the meeting. Provide a minimum of 1 week notice to the DEPARTMENT of the planned meeting.
4. Submit minutes of the meeting for distribution.

### C. Progress Meetings

1. Convene Commissioning progress meetings no less than once a month for the duration of the project.
2. The Commissioning Team shall be present.
3. Representatives of the DEPARTMENT shall be invited to the meeting. Coordinate with the DEPARTMENT.
4. The purpose of the meeting shall be to review progress of commissioning and review and adjust the CPM schedule with regard to commissioning efforts.
5. The DEPARTMENT shall review and approve minutes of the meeting prepared by the Contractor.

## 1.7 PROJECT DOCUMENTATION

### A. Commissioning Master Equipment and System List

1. Submit a Commissioning Master Equipment and System List including ALL equipment and systems that are required to be commissioned as identified in the technical specifications.
2. Group equipment according to construction sequences in the CPM schedule.
3. The List shall be presented in tabular form and shall include:
  - a. The item to be commissioned. Each item on the list shall have a unique identifier. Identify individual equipment items by their tags as scheduled on the drawings. Where multiple instances of the same tag occur, add a sequence number with a location identifier.
  - b. Identifiers of the CPM Schedule entry that include the Prefunctional Installation Examination and the Functional Performance Test for the item.
  - c. An identifier to the Prefunctional Installation Examination Checklist required to document proper installation.
  - d. An identifier to the Functional Checkout Checklist required to document proper operation.
  - e. An identifier to the syllabus under which training for the equipment will occur.
  - f. An identifier to a document listing the required tests and certifications that must be completed prior to Prefunctional Installation Examination and Functional Performance Testing.
  - g. Provisions to record completion of:
    - 1). Submittal and acceptance of installation tests and certifications as required in the technical specifications for the equipment or system.
    - 2). Prefunctional Installation Examination Checklists
    - 3). Functional Performance Test Checklists

- 4). Submittal of O&M manuals
  - 5). Completion of Training
  - h. Enter one commissioned item per line. Commissioned items shall consist of following, and as required by Section 16995:
    - 1). Equipment to be commissioned as a single piece of equipment. (e.g., DBC Access Controller, etc.)
    - 2). Systems that require commissioning as a completed assembly of two or more pieces of equipment (e.g. Access Control System Portals, etc) shall be entered as a line item distinct from the individual pieces. In these cases, the Installation Examination Checklist may have no entry, while the Functional Performance Test Checklist does.
  4. Maintain the List throughout the construction, and submit updated versions Monthly
  5. Submit the schedule in Microsoft Excel format.
- B. Prefunctional Installation Examination Checklist
1. Prefunctional Installation Examination Checklists shall be used to document that each piece of equipment is installed in compliance with the Contract. Prefunctional Checklists are required to verify and record that the equipment is connected and operational and ready for functional performance testing. Each piece of equipment undergoing commissioning receives a full prefunctional installation examination checkout. Sampling strategies shall not be used. All prefunctional testing associated with a system shall be completed prior to formal functional performance testing of equipment or subsystems of the given system.
  2. Submit a Prefunctional Installation Examination Checklist for each type of equipment and system for approval. Refer to the technical specifications for specific requirements for contents of each checklist. Refer to Section 16998 for sample electrical prefunctional checklists.
  3. Prefunctional Installation Examination Checklists may be arranged in tabular format so that multiple pieces of similar equipment are shown on one sheet. All equipment listed on tabular checklists shall be logically grouped together, and located in the same commissioning phase.
- C. Functional Performance Test Checklists
1. Functional performance testing shall take place to demonstrate that each system is operating according to the design intent and Contract Documents. Areas of deficient performance shall be identified and corrected to improve the operation and functioning of the systems.
  2. In general, each system shall be operated through all modes of operation (such as normal/degraded/emergency conditions) where there is a specified system response. Verify each sequence in the sequences of

- operation. Verify proper responses to such modes and conditions as power failure, fire alarm, etc. Specific modes required in this project are noted in Divisions 13 and 16 technical specification sections.
3. Prior to submitting test procedures the Contractor shall obtain all required documentation and shall incorporate change orders affecting equipment or systems, including updated points lists, program code, control sequences and parameters. Using the testing parameters in Divisions 13 and 16 technical specification sections the Contractor shall develop specific test procedures and forms to verify and document the proper operation of each piece of equipment and system. Each Electrical Commissioning Representative responsible shall assist the CCR in developing the test and documentation procedure. The proposed test procedure shall be submitted to the DEPARTMENT for approval as noted elsewhere in this section.
  4. Submit a Functional Performance Checklist for each type of equipment and system undergoing functional testing for approval. Refer to the technical specifications for specific requirements for contents of each checklist. Refer to Section 16997 for functional testing requirements and sample electrical functional performance checklists.
  5. Functional Performance Test Checklists may be arranged in tabular format so that multiple pieces of similar equipment are shown on one sheet. All equipment listed on tabular checklists shall be logically grouped together, and located in the same commissioning phase.
- D. Submittal Schedule: Submit a list of submittals required in each Section of the Specifications.
1. Include the following items:
    - a. Product submittals
    - b. Shop Drawings
    - c. Qualifications
    - d. Tests
    - e. Certifications
    - f. O&M Manuals
    - g. Design Manuals
    - h. Software Manuals
    - i. Licenses
  2. The Schedule shall be arranged in order of the Specification Sections.
  3. Include the date each item will be submitted. Coordinate with the CPM Schedule.
- E. List of System Training requirements. Submit a list of all equipment and system training requirements that summarizes the training requirements described in each technical specification section. The list shall be in tabular format and include:
1. Specification Section



2. Equipment or system
  3. Trainer qualifications
  4. Training time requirements, including phasing.
  5. Scope of training required.
- F. Training Syllabus: Include the following in each training syllabus:
1. Specification Section
  2. Equipment or system for which the syllabus applies.
  3. Training time requirements, including phasing.
  4. An outline of the main points of topics that will be covered under the training program.
  5. Approximate amount of time that will be allocated for each topic or group of topics.
  6. Training topics shall include use of appropriate O&M manual.
- G. Completion Certificate
1. Submit a Letter of Certification upon completion of commissioning that the following has occurred:
    - a. Prefunctional Installation Examinations have been performed on all required equipment and all checklists have been completed and accepted.
    - b. Functional tests have been performed on all required equipment and all checklists have been completed and accepted.
    - c. All O&M manuals have been submitted and accepted.
    - d. All training requirements have been completed.

## **1.8 SCHEDULING**

- A. Include the following as items in the CPM Schedule required under Section 01310:
1. Submittals required under this Section.
  2. Prefunctional Installation Examination Checklists (PE) for each item of Work identified in the CPM schedule. All equipment and systems included in the item of Work shall be identified in the Commissioning Master Equipment and System List with the corresponding CPM identifier.
  3. Functional Performance Test Checklists (FT) for each item of Work identified in the CPM schedule. All equipment and systems included in the item of Work shall be identified in the Commissioning Master Equipment and System List with the corresponding CPM identifier and Functional Performance Test.
  4. PE Checkouts shall be phased to correspond to actual construction sequencing in the CPM schedule such that equipment will be checked in each area as soon as practical after installations are complete.
  5. Training Syllabus Submittals.
  6. Training Sessions.

## **1.9 SEQUENCING**

- A. Prefunctional Installation Examination Checklists (PE), test reports and certifications for equipment or systems shall be submitted and accepted prior to Functional Test Checkout of the equipment or system. Refer to the technical specifications for specific requirements.
- B. O&M manuals shall be submitted and accepted at least 30 days prior to training sessions for the systems covered by manual.

## **PART 2 - PRODUCTS      NOT USED**

## **PART 3 - EXECUTION**

### **3.1 GENERAL**

- A. The Contractor's Commissioning Representative shall actively participate in the submittal, shop drawing, and construction phases of the project to ensure compliance with the commissioning requirements. Coordinate with the work of the project Quality Control Representatives (see Section 01400).

### **3.2 RESPONSIBILITIES DURING CONSTRUCTION**

- A. Arrange for all necessary representatives from each discipline that are responsible for performing the commissioning activities to be present at the scheduled activity.
- B. Notify the DEPARTMENT of Installation Examinations or Functional Performance Tests schedules a minimum of 72 hours before they are to occur. Functional Tests shall not proceed without the presence of the DEPARTMENT'S representative unless authorized by the DEPARTMENT.
- C. The agency or installer that performs the tests of the individual systems required within each specification section shall provide instrumentation necessary to perform the test. Instruments shall be operated by the agency or installer, or additionally at the request of the DEPARTMENT.
- D. Provide all tools, ladders, and communication equipment required to properly access equipment and efficiently perform commissioning activity.

### **3.3 FAILED INSTALLATION EXAMINATION AND FUNCTIONAL PERFORMANCE TESTS.**

- A. Installation Examination or Functional Performance Tests found to be unacceptable shall be re-examined or retested until they are acceptable to the DEPARTMENT.
- B. Failure of proper personnel to be present to perform examination or testing at a scheduled commissioning activity will be deemed to be a failed test or examination.

- C. The DEPARTMENT will witness one additional Installation Examination or Functional Performance Test at no charge to the CONTRACTOR for any particular piece of equipment or system. CONTRACTOR shall pay all checkout costs associated with additional checkouts beyond these two checkouts.

**END OF SECTION 01650**

## **SECTION 01700**

### **CONTRACT CLOSEOUT**

#### **PART 1 GENERAL**

##### **1.01 REQUIREMENTS INCLUDED**

- A. Closeout Procedures.
- B. Final Cleaning.
- C. Project Record Documents.
- D. Operation and Maintenance Data.
- E. Warranties.
- F. Spare Parts and Maintenance Materials.

##### **1.02 RELATED REQUIREMENTS**

- A. Document 00700 - General Conditions: Fiscal provisions, legal submittals, and other administrative requirements.
- B. Section 01010 - Summary of Work.
- C. Section 01400 – Quality Control: Departmental Inspection Services.
- D. Section 01500 - Construction Facilities and Temporary Controls: Cleaning during construction.

##### **1.03 CLOSEOUT PROCEDURES**

- A. Substantial Completion and Final Completion:
  - 1. Substantial Completion:
    - a. Submit the following prior to requesting a Substantial Completion Inspection:
      - 1. Evidence of Compliance with Requirements of Governing Authorities:
        - I. Certificate of Occupancy.
        - II. Required Certificates of Inspection.

2. Project Record Documents in accordance with sub section 1700-1.05

- b. Substantial Completion shall be considered by the DEPARTMENT when:
  - 1. Written notice is provided 7 days in advance of inspection date.
  - 2. List of items to be completed or corrected is submitted.
  - 3. Certificate of Occupancy is submitted.
  - 4. Certificates of Inspection for required inspections have been submitted.
  - 5. Project Record Documents for the Work or the portion of the Work being accepted are submitted and approved.
  - 6. All keys are turned over to the DEPARTMENT.
- c. Should the DEPARTMENT inspection find Work is not substantially complete, the Department will promptly notify CONTRACTOR in writing, listing observed deficiencies.
- d. The CONTRACTOR shall remedy deficiencies and send a second written notice of Substantial Completion.
- e. When the DEPARTMENT finds Work is substantially complete the DEPARTMENT will prepare a certificate of Substantial Completion in accordance with provisions of General Conditions

B. FINAL COMPLETION:

- 1. When CONTRACTOR considers Work is complete, submit written certification that:
  - a. Contract Documents have been reviewed.
  - b. Work has been inspected for compliance with Contract Documents.
  - c. Work has been completed in accordance with Contract Documents, and deficiencies listed with certificate of Substantial Completion have been corrected.
  - d. Work is complete and ready for final inspection.
- 2. Should the DEPARTMENT inspection find Work incomplete, DEPARTMENT will promptly notify CONTRACTOR in writing listing observed deficiencies.

3. CONTRACTOR shall remedy deficiencies and send a second certification of Final Completion.

4. When DEPARTMENT finds Work is complete, DEPARTMENT will consider closeout submittals.

**C. REINSPECTION FEES**

1. Should status of completion of Work require more than two re-inspections by the DEPARTMENT due to failure of Work to comply with CONTRACTOR's responsibility, the DEPARTMENT will deduct the cost of re-inspection from final payment to CONTRACTOR as provided in the Contract Documents.

2. Re-inspection fees shall not exceed \$5,000 for any one re-inspection.

**D. CLOSEOUT SUBMITTALS**

1. Warranties and Bonds: Under provisions of Section 01700.

2. Evidence of Payment: In accordance with Conditions of the Contract.

3. Consent of Surety to Final Payment.

4. Certificates of Insurance for Products and Completed Operations: In accordance with Supplementary Conditions.

5. Certificate of Release.

**E. APPLICATION FOR FINAL PAYMENT**

1. Submit application for final payment in accordance with provisions of the General Conditions of the Contract.

F Using Agency will occupy Concourse A for the purpose of conduct of business, under provision stated in certificate of Substantial Completion.

G. DEPARTMENT will issue a summary Change Order reflecting final adjustments to Contract Price not previously made by Change Order.

**1.04 FINAL CLEANING**

A. Execute final cleaning prior to Substantial Completion inspection.

B. Maintain cleaning until the DEPARTMENT issues certificate of substantial Completion.

F. Remove waste, debris, and surplus materials from the site. Clean grounds; remove stains, spills, and foreign substances from paved areas and sweep clean. Rake clean other exterior surfaces.

### **1.05 PROJECT RECORD DOCUMENTS**

- A. Maintain on site, one set of the following Record Documents; record actual revisions to the Work:
  - 1. Contract Documents.
  - 2. Addenda.
  - 3. Change Orders and other modifications to the Contract.
  - 5. Governing agency approval/monitoring documents.
- B. Ensure entries are complete and accurate, enabling future reference by DEPARTMENT.  
Store Record Documents separate from documents used for construction.
- C. Record information concurrent with construction progress.
- D. SPECIFICATIONS: Legibly mark and record at each product section description of actual products installed, including the following:
  - 1. Manufacturer's name and product model and number.
  - 2. Product substitutions or alternates utilized.
  - 3. Changes made by Addenda and Modifications.
- E. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction graphically to scale including:

### **1.06 OPERATION AND MAINTENANCE INSTRUCTIONS**

- A. All O&M manuals shall be submitted prior substantial completion.

### **1.07 WARRANTIES**

- A. All manufacturers warranty certificates shall be submitted prior substantial completion.

### **1.08 SPARE PARTS AND MAINTENANCE MATERIALS**

- A. All spare parts, extra stock, and maintenance materials shall be stockpiled on-site, per the direction of the DEPARTMENT, prior substantial completion.

## **PART 2 PRODUCTS**

**Not Used**

## **PART 3 EXECUTION**

**Not Used**

**END OF SECTION**



**SECTION 13710**  
**ACCESS CONTROL SYSTEM (ACS)**

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

1. General description, functional requirements, characteristics, and criteria for the complete installation of a replacement Access Control System (ACS) for Ted Stevens Anchorage International Airport (ANC).

B. Related Sections:

1. Section 01300 – Submittals
2. Section 01540 – Security
3. Section 01650 – Commissioning Requirements
4. Section 13720 – ACS Sequence and Cutover
5. Section 13730 – ACS Performance Verification Testing
6. Section 16745 – Telecommunications Distribution Systems
7. Section 16747 – Telecommunications Optical Fiber Distribution
8. Section 16749 – Local Area Network
9. Section 16995 – Electrical Commissioning
10. Section 16997 – Electrical Functional Testing Requirements
11. Section 16998 – Electrical Prefunctional Installation Examination Requirements
12. Division 16 - Electrical: Other sections of Division 16 as they apply to installation of the ACS.

**1.2 GENERAL**

- A. Provide all labor, products and services required for the installation, programming, checkout, and testing of a physically complete and fully functional ACS as detailed herein and on the Contract Drawings.
- B. Where the work of several trades is involved, coordinate all related work to provide each system complete and in proper operating order.
- C. Cooperate with all others involved in the Project, with due regard to their work, to promote rapid completion of the entire Project.
- D. Local conditions: The Contractor shall thoroughly familiarize itself with the work as well as the local conditions under which the work is to be performed. Schedule work with regard to seasons, weather, climatic conditions, and all other local conditions, which may affect the progress and quality of the work.
- E. Provide commissioning services as specified in Section 01650 – Commissioning Requirements and 16995 – Electrical Commissioning

### 1.3 SCOPE OF WORK

#### A. Access Control System

1. General: ANC's existing Access Control and Identification (ID) Badging System was manufactured by Dorado Systems, Inc. and consists of a MAXX-NET headend, IDC-60 access control panels and HID R10 (mullion mount) R40, RK40 (with integral keypad) and R90 (long range) contactless smart card readers. The headend and access control panels (IDCs) shall be replaced in their entirety with a new Enterprise Class ACS and ID Badging System. The new ACS shall communicate over an expansion of ANC's existing Information Technology (IT) Ethernet Local Area Network (LAN). The expansion of ANC's LAN shall be performed under this Contract, refer to Section 16749. The existing HID R10, R40, RK40 and R90 contactless smart card readers shall be reused. The new system shall provide alarm monitoring and control and ID badging in compliance with the requirements of the Code of Federal Regulations (CFR) 59, Part 1542 Access Control Systems. The new system shall be interoperable with the following ANC legacy security subsystems:
  - a. Digital Video Recording System (DVRS): ANC's existing DVRS consists of Verint LVM software, Version 4.5.1.B and 38 Model VR-6016 digital video recorders. Refer to Part 2 and 3 of this specification for required interoperability functionality.
  - b. Closed-Circuit Television (CCTV) System: ANC's existing CCTV system consists of a Vicon NOVA™ Ethernet based matrix switching system with approximately 600 CCTV cameras, 112 monitors and "360 Surveillance" Chameleon Graphical User Interface (GUI) software. Refer to Part 2 and 3 of this specification for required interoperability functionality.
  - c. Intercom System: ANC's existing Intercom System consists of a Zenitel AlphaCom communications system communicating with 94 intercom call stations and three master stations. This system shall be expanded to support bidirectional audio communications between the existing intercom master stations and new intercom stations installed as part of this contract. Utilize spare intercom bidirectional audio channels at the existing AlphaCom exchange for connection of the new intercoms to the existing system. Refer to Part 2 and 3 of this specification for required interoperability functionality. Refer to floor plans for new intercom locations.

B. The scope of work at access controlled portals is broken into six areas as detailed below. Refer to Section 13720-3.1 for additional information on sequencing and cutover from the existing ACS to the new ACS.

1. North Terminal: As noted below unless otherwise noted on Contract Drawings.
  - a. Demolish existing door and card reader cabling and door power supplies.
  - b. Reuse existing electrical door hardware.
  - c. Provide a DBC Interface Termination Box (ITB) to terminate cabling from the door devices, power supplies and DBC
  - d. Provide new conduit from Door to ITB.
  - e. At doors with surface mounted raceway, replace with concealed raceway.
  - f. Provide conduits from ITB to DBC.
  - g. Provide conduit homerun from DBC to local area Telecom Room (TR).
  - h. Provide door power supply(s).
  - i. Provide cabling between the door devices, power supply(s) and the ITB.
  - j. Provide cabling between ITB and DBC.
  - k. Provide cabling between card readers and DBC routed via the ITB (do not terminate in ITB).
  - l. Provide cabling between DBC and TR.
  - m. Provide horn/strobe device to provide local door alarm at each access controlled portal. Refer to ACS Door Schedule at the end of this section for information on existing doors equipped with local alarm horn only (utilize existing box and conduit) and existing doors with no local alarm (provide box and conduit). Provide horn/strobe cabling.
  - n. Refer to Details on Sheet E502 for additional information.
  - o. Add access control to existing Door NB155 including all required electrical devices and door hardware, cabling, raceways, etc., for a physically complete and functional portal. Refer to Detail on Sheet E504.
  - p. Convert existing Door ND322 from a delayed egress door to a non-delayed egress door. Refer to Detail on Sheet E504.
  - q. Convert existing Door NB113 from a non-delayed egress door to a delayed egress door including installation of an intercom. Refer to Detail on Sheet E504.
  - r. Replace existing Von Duprin "Chexit" devices with Von Duprin DE5101 delayed egress system at existing Doors identified in the ACS Door Schedule and on the Contract Drawings.
  - s. Add access control to existing overhead doors NBC110, 112, 114 and 116 including all required electrical devices and door hardware, cabling, raceways etc. for physically complete and functional portal. Refer to Detail on Sheet E504.

2. Outlying Buildings (ARFF and ID Badge Office):
  - a. Demolish existing door and card reader cabling and door power supplies.
  - b. Reuse existing electrical door hardware.
  - c. Provide a DBC Interface Termination Box (ITB) to terminate cabling from the door devices, power supplies and DBC
  - d. Provide new conduit from Door to ITB.
  - e. At doors with surface mounted raceway, replace with concealed raceway.
  - f. Provide conduits from ITB to DBC.
  - g. Provide conduit homerun from DBC to local area Telecom Room (TR).
  - h. Provide door power supply(s).
  - i. Provide cabling between the door devices, power supply(s) and the ITB.
  - j. Provide cabling between ITB and DBC.
  - k. Provide cabling between card readers and DBC routed via the ITB (do not terminate in ITB).
  - l. Provide cabling between DBC and TR.
  - m. Provide horn/strobe device to provide local door alarm at each access controlled portal. Refer to ACS Door Schedule at the end of this section for information on existing doors equipped with local alarm horn only (utilize existing box and conduit) and existing doors with no local alarm (provide box and conduit). Provide horn/strobe cabling.
  - n. Refer to Details on Sheet E503 for additional information.
  - o. Add access control to Door FB104 including all required electrical devices and door hardware, cabling, raceways, etc., for a physically complete and functional portal. Refer to Detail on Sheet E504.
3. Remote Gates:
  - a. Gate N17A/B:
    - 1). Provide environmental fiber optic termination cabinet in accordance with Specification Section 16747 adjacent to existing ACS cabinet on gate cabinet pedestal.
    - 2). Provide DBC Enclosure, DBC, and DBC power supply adjacent to existing ACS cabinet on gate cabinet pedestal.
    - 3). Provide ACS Edge switch in accordance with Specification Section 16749.
    - 4). Provide HID RK40 card readers to replace two (2) existing keypads. Connect readers to DBC. Extend existing conduit to DBC. Provide new card reader cable.
    - 5). Provide balanced magnetic switches (BMS) on gates to monitor gate positions. Provide new conduit and cabling to DBC.
    - 6). Connect output of DBC to existing gate operators to operate gates on valid card swipe. Extend existing conduit and cabling to DBC.

- 7). Connect gate to ACS using fiber optic cable provided per Sheet E701 and the Site Plans.
  - 8). Provide all required electrical devices, connections, patch cords, etc., for a physically complete and functional portal. Refer to Detail on Sheet E006.
- b. Gate N59A:
- 1). Provide DBC Enclosure, DBC, and DBC power supply adjacent to existing ACS cabinet on gate cabinet pedestal.
  - 2). Provide ACS Edge switch in accordance with Specification Section 16749.
  - 3). Provide one Ethernet over bonded twisted pair transceiver adjacent to ACS Edge switch per Sheet E701.
  - 4). Provide HID RK40 card reader to replace existing keypad. Connect card reader to DBC. Extend existing conduit to DBC. Provide new card reader cable.
  - 5). Provide balanced magnetic switches (BMS) on gate to monitor gate position. Provide new conduit and cabling to DBC.
  - 6). Connect output of DBC to existing gate operators to operate gates on valid card swipe. Extend existing conduit and cabling to DBC.
- 
- 7). Connect gate to ACS using transceivers, twisted pairs, and existing fiber optic cable per Sheet E701.
  - 8). Provide all required electrical devices, connections, patch cords, etc., for a physically complete and functional portal. Refer to Detail on Sheet E006.
- c. Gate N64
- 1). Remove the existing IDC-60 controller from the existing control panel enclosure.
  - 2). Provide DBC Enclosure, DBC, and DBC power supply adjacent to existing ACS cabinet on gate cabinet pedestal.
  - 3). Provide ACS Edge switch in accordance with Specification Section 16749.
  - 4). Provide one Ethernet over bonded twisted pair transceiver adjacent to ACS Edge switch to provide ACS connection via existing twisted pairs and fiber optic cabling to remote Gate N59A per Sheet E701.
  - 5). Connect existing card reader to DBC. Extend existing conduit to DBC. Provide new card reader cabling.
  - 6). Connect existing balanced magnetic switches (BMSs) to DBC. Extend existing conduit and cabling to DBC.
  - 7). Connect output of DBC to existing gate operator to operate gate on valid card swipe. Extend existing conduit and cabling to DBC.
  - 8). Connect gate to ACS using existing fiber optic cable per Sheet E701.

- 9). Provide all required electrical devices, connections, patch cords, etc., for a physically complete and functional portal. Refer to Detail on Sheet E005.
- d. Gates N30A/B, N41A/B and ASIG Fuel Gate:
  - 1). Remove the existing IDC-60 controllers from the existing control panel enclosures.
  - 2). Provide DBC enclosures, DBCs, and DBC power supplies adjacent to existing ACS cabinets on gate cabinet pedestals.
  - 3). Provide ACS Edge switch in accordance with Specification Section 16749.
  - 4). Connect existing card readers to DBCs. Extend existing conduit to DBCs. Provide new card reader cabling.
  - 5). Connect existing balanced magnetic switches (BMSs) to DBCs. Extend existing conduit and cabling to DBC.
  - 6). Connect output of DBCs to existing gate operators to operate gates on valid card swipe. Extend existing conduit and cabling to DBC.
  - 7). Connect gates to ACS using existing fiber optic cable per Sheet E701 and the Site Plans.
  - 8). Provide all required electrical devices, connections, patch cords, etc., for a physically complete and functional portal. Refer to Details on Sheets E005 and E006.
- e. Gate N10 and Gate E21:
  - 1). Remove the existing IDC-60 controllers from the existing control panel enclosure.
  - 2). Provide DBC enclosures, DBCs, and DBC power supplies adjacent to existing ACS cabinets inside guard shacks.
  - 3). Provide ACS Edge switches in accordance with Specification Section 16749.
  - 4). Connect existing card readers to DBCs. Extend existing conduit to DBCs. Provide new card reader cabling.
  - 5). Connect output of DBCs to valid card/invalid card lights. Extend existing conduit and cabling to DBCs.
  - 6). Gate N10: Connect gate to ACS using existing fiber optic cable per Sheet E701.
  - 7). Gate E21: Connect gate to ACS using existing fiber optic cable and fiber optic cable provided per Sheet E701 and the Site Plans.
  - 8). Provide all required electrical devices, connections, patch cords, etc., for a physically complete and functional portal. Refer to Detail on Sheet E005.
- f. NT Employee Parking Gate and ST Employee Parking Gates:
  - 1). Remove the existing IDC-60 controllers from the existing control panel enclosures.
  - 2). Provide DBC enclosures, DBCs, and DBC power supplies inside gate operator pedestals.

- 3). Provide ACS Edge switch in accordance with Specification Section 16749.
  - 4). Connect existing card readers to DBCs. Utilize existing conduit. Provide new card reader cabling.
  - 5). Connect output of DBCs to gate operators. Utilize existing conduit and cabling.
  - 6). NT Employee Parking: Connect gate to ACS using existing fiber optic cable per Sheet E701.
  - 7). ST Employee Parking Gates: Connect gate to ACS using existing fiber optic cable and fiber optic cable provided per Sheet E701 and the Site Plans.
  - 8). Provide all required electrical devices, connections, patch cords, etc., for a physically complete and functional portal. Refer to Details on Sheets E005 and E006.
4. South Terminal Concourse C and Field Maintenance Facility (FMF):
- a. Reuse existing cabling, door power supplies and electrical door hardware.
  - b. Remove the existing IDC-60 controller from the existing control panel enclosure.
  - c. Install the new DBC in the existing control panel enclosure and reconnect to existing devices/cabling.
  - d. Provide conduit homerun from DBC to local area Telecom Room (TR).
  - e. Provide cabling between DBC and TR.
  - f. Provide horn/strobe device to provide local door alarm at each access controlled portal. Refer to ACS Door Schedule at the end of this section for information on existing doors equipped with local alarm horn only (utilize existing box and conduit) and existing doors with no local alarm (provide box and conduit).
  - g. Refer to Details on Sheet E502 for additional information.
  - h. Add access control to Door AM1330A including all required electrical devices and door hardware, cabling, raceways, etc., for a physically complete and functional portal. Refer to Detail on Sheet E504.
5. South Terminal Main Terminal and Concourses A and B (South Terminal Seismic and Security Retrofit Project No. 59016 area):
- a. This area is currently under remodel. As part of this project new security doors will be installed in Concourse B and in parts of the Main Terminal and Concourse A.
  - b. For these portals electrical door hardware, door power supply(s), horn/strobe devices, conduit and door cabling will be installed by the Retrofit Contractor. These devices will be cabled back to a DBC Interface Termination Box (ITB) provided by the Retrofit Contractor and terminated to provide a clean demarcation point for connection to work provided under this Contract. The Retrofit Contractor will also

- provide card readers and conduit only from the card reader(s) to the ITB.
  - c. The Retrofit Contractor will provide 2@ 1 inch conduits from the ITB to the approximate location of the DBC. The Retrofit Contractor will also provide a 1 inch conduit homerun from the approximate location of the DBC to the local area Telecom Room (TR). Extend these conduits and connect to DBC under this Contract.
  - d. Provide cabling between the ITB and the DBC to provide a physically complete and functional system. In addition provide cabling from the card reader(s) to the DBC routed via the ITB (do not terminate in ITB).
  - e. Refer to Details on Sheet E503 for additional information.
  - f. For existing access controlled portals that remain and are not being retrofitted under Project No. 59016 within this area refer to Part 6 immediately below.
6. South Terminal's Main Terminal and Concourse A access controlled portals not affected by South Terminal Seismic and Security Retrofit Project No. 59016:
- a. Demolish existing door and card reader cabling and door power supplies.
  - b. Reuse existing electrical door hardware.
  - c. Provide a DBC Interface Termination Box (ITB) to terminate cabling from the door devices, power supplies and DBC
  - d. Provide new conduit from Door to ITB.
  - e. At doors with surface mounted raceway, replace with concealed raceway.
  - f. Provide conduits from ITB to DBC.
  - g. Provide conduit homerun from DBC to local area Telecom Room (TR).
  - h. Provide door power supply(s).
  - i. Provide cabling between the door devices, power supply(s) and the ITB.
  - j. Provide cabling between ITB and DBC.
  - k. Provide cabling between card readers and DBC routed via the ITB (do not terminate in ITB).
  - l. Provide cabling between DBC and TR.
  - m. Provide horn/strobe device to provide local door alarm at each access controlled portal. Refer to ACS Door Schedule at the end of this section for information on existing doors equipped with local alarm horn only (utilize existing box and conduit) and existing doors with no local alarm (provide box and conduit). Provide horn/strobe cabling.
  - n. Replace existing Von Duprin "Chexit" devices with Von Duprin DE5101 delayed egress system at existing Doors identified in the ACS Door Schedule and on the Contract Drawings.
  - o. Refer to Details on Sheet E502 for additional information.



- p. Add access control to existing Door SG121 including all required electrical devices and door hardware, cabling, raceways, etc., for a physically complete and functional portal.
- C. Provide all products and perform all installation, programming, testing and debugging of the system required to ensure a fully integrated, functional and operating system.
- D. Provide system documentation and submittals.
- E. Provide warranty and maintenance support.
- F. Comply with codes, ordinances, regulations, and other legal requirements of public authorities which bear on installation and performance of Work.
- G. Provide all related demolition, cutting and patching in support of the project. Refer to the Contract Drawings and Section 16010-3.1 for additional requirements and information.
- H. The system shall consist of the following major components:
  - 1. Security Management System Software
  - 2. Access Controller (DBC)
  - 3. ACS Server
  - 4. ACS Workstation
  - 5. Liquid Crystal Display
  - 6. ID Badge Printer
  - 7. ID Badge Production Kit
  - 8. ACS Report Printer
  - 9. Biometric Fingerprint Reader
  - 10. 13.56 MHz Contactless Smart Card
  - 11. 13.56MHz Contactless Smart Card Reader
  - 12. Identification Scanner
  - 13. Fiber Optic Intercom Transceiver
  - 14. Intercom
  - 15. Horn/Strobe Device
  - 16. Uninterruptible Power Supply
  - 17. DBC Interface Termination Box
  - 18. Electrical Door Hardware
  - 19. Power Supply – Electrical Door Hardware
  - 20. Cable, Wire and Labels

#### **1.4 REFERENCES**

- A. The following codes and standards or latest released version shall apply to the work of this project:
- B. Code of Federal Regulations (CFR)
  - 1. CFR Title 49, Chapter II, Subchapter C, Part 1542
  - 2. 47 CFR 15 et seq.: Radio Frequency Devices

- C. International Fire Code
  - 1. IFC (2003): International Fire Code
- D. International Building Code
  - 1. IBC (2003): International Building Code
- E. American National Standards Institute
  - 1. NESC (2002): National Electrical Safety Code
- F. National Fire Protection Association (NFPA)
  - 1. NFPA 70 (2005): National Electrical Code (NEC)
  - 2. NFPA 101 (2006): Life Safety Code
- G. Telecommunications Industry Association/Electronics Industry Association (TIA/EIA)
  - 1. EIA-310-D (1992): Cabinets, Racks, Panels, and Associated Equipment
  - 2. TIA/EIA-568-B: Commercial Building Telecommunications Cabling Standard
- H. Underwriters Laboratories Inc. (UL)
  - 1. UL 294 (1994): Standard for Safety for Access Control System Units
- I. National Institute of Standards and Technology (NIST)
  - 1. FIPS PUB 201 (2006): Personal Identity Verification (PIV) of Federal Employees and Contractors

## **1.5 CONFLICTS**

- A. Where conflicts exist between referenced requirements, comply with the one establishing the more stringent requirements.
- B. Where conflicts exist between drawings and specifications, comply with the one establishing the more stringent requirements.
- C. Where conflicts exist in equipment quantities, provide the greater amount.

## **1.6 SUBMITTALS**

- A. Provide submittals for all products in this section in accordance with the following requirements and the requirements of Section 16010 - Electrical General Provisions and Division 1.
- B. Unless specified otherwise in specific sections the submittal requirements shall be applicable to all equipment contained in all of the Division 13 specifications. Gather Division 13 data together and organize and present as one unified submittal in accordance with Section 01300 – Submittals.

- C. **System Description and Analyses:** Include in submittals complete system descriptions, analyses and calculations used in sizing the equipment required by the specifications. Descriptions and calculations shall show how the equipment will operate as a system to meet the performance of this Specification.
- D. **Product Data Submittals:**
  - 1. Submit catalog cut sheets, technical data sheets, manufacturer specifications and/or diagrams necessary to illustrate a product, material or system for the work. Product data literature is required on all items of material and equipment and should be clearly marked; identifying specific items proposed with a reference to the specification requirement the item is being submitted under.
  - 2. Product data shall include adequate descriptive literature and catalog cut sheets required for the Department to ascertain that the proposed equipment and materials comply with specification requirements.
- E. **Drawings:**
  - 1. System block diagrams.
  - 2. System riser diagrams.
  - 3. Point-to-Point wiring diagrams.
  - 4. Floor plans detailing device locations.
  - 5. Equipment room layouts to scale.
  - 6. Installation of ACS equipment in consoles, cabinets and racks, including wiring diagrams and rack elevations.
  - 7. Installation of ACS equipment located in the equipment rooms, including wiring diagrams and rack elevations.
  - 8. Surge protection device installation details.
  - 9. Details of interconnection with the CCTV, Intercom and DVRS subsystems.
  - 10. Sequence of operations for each typical security door type.
  - 11. Details of interconnection to fiber optic backbone system.
  - 12. Prepare using the latest release of AutoCAD.
- F. DBC panel layouts and enclosure mock-up.
- G. Training Schedule.
- H. Cable labeling convention.
- I. **Graphics:** Project specific examples of graphics used for system programming, ACS Alarm GUI, ID Badge and Visitor Management workstations.
- J. **Record Shop Drawings:** Provide a copy of corrected, approved shop drawings for the project, updated to show as-built conditions. Include the manufacturers' brochures in the "as-built" documentation. Plans shall indicate exact device locations, panel terminations, cable routes and wire numbers as tagged and color-coded on the cable tag. Final point-to-point wiring diagrams of all equipment connections and each type of device shall be included in the "as-

builds." Prepare "as-builts" using the latest release of AutoCAD and deliver files to the Department.

K. Warranty information: All materials relating to warranties.

L. Manufacturer's training certifications of project personnel.

M. Manuals:

1. General:

- a. Provide complete sets of manuals and other information necessary for the operation and maintenance of the system in accordance with Division 1 requirements.
- b. Manuals shall be project specific and include standard original copies of the manufacturer's manuals available for the systems, equipment and devices provided under the project.
- c. Provide indexed DVD copies of all information developed specifically for the project as well as all available CD or DVD copies of manufacturer's manuals.
- d. Manuals shall include names, addresses, and telephone numbers of each subcontractor installing equipment and systems, and nearest representatives for service and purchasing for each item of equipment for each system.
  - 1). The manuals shall have a table of contents and tab sheets. Tab sheets shall be placed at the beginning of each chapter or section and at the beginning of each appendix.
- e. The final copies delivered after completion testing shall include all modifications made during installation, checkout, and testing.
- f. Operation and Maintenance manuals shall be fully corrected to include review comments prior to final submission to the Department.

2. Design Manual: Design manual shall identify the theory of operation for the system, design philosophy, and specific functionality. A description of hardware and software functions and interfaces shall be included for all system operating modes. Submit manual with manufacturer's data for approval prior to development of the shop drawings.

3. Operator's Manual: The operator's manual shall describe operation of all software and hardware provided, including but not limited to:

- a. Access Control System:
  - 1). Security Management
  - 2). ID Badge
  - 3). Visitor Management
  - 4). Server Redundancy
  - 5). Access controlled portals
  - 6). Subsystem interfaces
- b. General hardware operations and descriptions

4. **Software Manual:** The software manual shall describe the functions of all software, and shall include all other information necessary to enable proper loading, testing and operation, including:
  - a. Definitions of terms and functions.
  - b. System setup procedures.
  - c. Interface definition.
  - d. Procedures for system generation.
  - e. Description of implementation of the program.
  - f. Description of required sequences for proper loading and configuration of software onto the workstations.
  - g. Description of complete GUI functionality including but not limited to the following:
    - 1). Icon sequence of operation.
    - 2). Graphical hierarchical map operation.
    - 3). CCTV system interoperability.
    - 4). DVRS interoperability.
    - 5). Intercom system interoperability.
  - h. Directory of all software installed under the project on a per computer basis including:
    - 1). Version.
    - 2). List of updates, fixes, service pack upgrades, etc.
    - 3). Attach a copies of software on a per computer basis as an appendix to the manual
  - i. Description of all communications protocols, including data formats, command characters, and a sample of each type of data transfer.
5. **Maintenance Manual:** The maintenance manual shall describe maintenance and service for all equipment including inspection, periodic preventive maintenance, fault diagnosis, and repair or replacement of defective components. Maintenance manual shall include the ACS equipment physical layout and schematics to the component level.

## 1.7 TRAINING

- A. **System Overview:** Conduct an on-site system overview for the Airport and Tenants (separate from the systems testing) of the ACS to instruct the users on the scope and operations of the systems.
- B. Provide on-site training by a qualified, factory-trained instructor for designated maintenance technicians and operations personnel on the operation and maintenance of the system(s). If trained personnel from the factory are required for training, they shall be provided on-site by the Contractor at no additional cost to the Owner.

- C. Provide the following training prior to the cutover of the first access controlled portal to the new system and operation of the system by the Department:
1. Demonstrate operation of system during System Overview tour. Demonstrate the system in all modes of operation.
  2. Provide a minimum of 120 hours of system maintenance training to designated airport personnel. Classes shall accommodate up to ten (10) students at one time. Provide three separate courses to accommodate three separate maintenance shifts.
    - a. Maintenance training shall cover all technical training required for maintenance, preventative maintenance and system adds, moves and changes including detailed instructions on system software modifications. In addition, provide in-depth training from a factory trained individual on the maintenance and repair of the ID badge printers provided as part of this project.
  3. Provide a minimum of 90 hours of operator training to the Department's Dispatch Operators. Classes shall accommodate up to four (4) students at one time. Provide three separate courses to accommodate three separate operator shifts.
  4. Provide a minimum of 80 hours of operator training to the Department's Dispatch Managers. Number of classes and class dates and times shall be coordinated with the Department. Each class shall accommodate up to four (4) students at one time.
  5. Provide a minimum of 80 hours of operator training to the Department's ID Badge Office personnel on the issuance and management of the ID Badge System. Number of classes and class dates and times shall be coordinated with the Department. Each class shall accommodate up to four (4) students at one time.
  6. Provide a minimum of 80 hours of operator training to the Department's Security Director and management, as determined by the Department, on all aspects of the system. Number of classes and class dates and times shall be coordinated with the Department. Each class shall accommodate up to four (4) students at one time.
  7. Provide the Department's Security Director with an off-site Crystal Reports Version 11 training course or on-site equivalent training on the following:
    - a. Creating a Report
    - b. Displaying Specific Report Data
    - c. Grouping Report Data
    - d. Building Formulas
    - e. Formatting Reports
    - f. Enhancing Reports
    - g. Creating Pie Charts
    - h. Distributing Data
  8. Provide course syllabus for all training courses in advance of each course, with outline of topics, time allotted for each topic, targeted audience and

training objectives. Submit training manuals to Department for review and approval a minimum of ten (10) working days in advance of scheduled training. Training shall not commence until training syllabus has been approved.

- D. Professionally record all on-site classroom training sessions and provide four (4) sets of labeled digital video disk(s) (DVD) to the Department.
  - 1. Provide recording of the training sessions, with DVD(s) clearly labeled. The requirements for the video production shall be as follows:
    - a. The video recording shall be produced by a professional company with construction knowledge and construction production experience. The production company shall meet the following requirements:
      - 1). A minimum of three years experience in the production of construction video production.
      - 2). Experience in full-length video production to include documentary, training production and interactive productions.
      - 3). Construction knowledge and/or experience in construction video documentation.
    - b. All on-site training sessions shall be recorded.
    - c. Video Specifications: All training DVD(s) shall be of professional industry standard quality and produced on a broadcast quality camera with a separate microphone attached to the trainer. Convert to hi-quality DVD(s). Video specifications shall include:
      - 1). Video shall be shot in broadcast quality format.
      - 2). Video shall be edited to eliminate valueless information.
      - 3). Final video product shall be produced on DVD format with time codes and chapter points at the Department's request. The final menu will be defined by the Department.
      - 4). The post-production shall include titling with clear descriptions throughout the production.
    - d. Audio Specifications: Audio specifications shall include.
      - 1). Speakers shall be professionally wired with microphone(s) to ensure clarity of sound. All audio shall be archived in DVD format.
    - e. Trainers appearing on the tapes shall provide clear and concise information from a training syllabus that is developed by the Contractor.
    - f. For larger systems and equipment, not more than one training session shall be put on a single DVD.
    - g. Provide individual training DVD(s) for the type of training being conducted:
      - 1). Training sessions for general system configuration and installation procedures.
      - 2). System operation training.
      - 3). Maintenance training.

- E. Video record training sessions specific to programmed systems. Provide four (4) complete copies of all training DVDs to the Department.
- F. Provide an index of syllabi and corresponding DVDs to the Department, indicating course titles/topics and dates of training sessions.
- G. In addition to the on-site training specified herein, provide factory training in the form of a factory certification course, AMAG V6 Fundamentals Course or equivalent, for four ANC designated technicians on the ACS with the same software and equipment as installed at ANC. Cost borne by the Contractor shall include two-way air travel, room, board and tuition.
- H. Submit a training schedule as a subset of the Baseline Project Schedule developed in accordance with Section 01310 – Progress Schedules.

## **1.8 QUALITY ASSURANCE**

- A. The equipment manufacturers shall have been in business manufacturing similar products for at least 10 years.
- B. Bidder qualification: Equipment shall be installed by qualified individuals having at least five (5) years experience installing and maintaining similar equipment. The qualified individuals shall have installed at least two (2) systems of similar type with a minimum of 50 ACS controlled doors within the past five (5) years. Submit evidence of successful installation, owner training and maintenance for a minimum of the previous five years with the bid (refer to Bid Form, Section 00310). Provide listing of projects with verifiable references with names and telephone numbers. Provisions of this paragraph will be verified by the Department prior to issuance of a letter of award to the apparent low bidder. A failure to provide this information or to comply with these qualifications will result in non-responsive bid.
- C. The Contractor shall be a factory-authorized and trained dealer of the system, at the time of issuance of the project documents for bidding purposes, and shall be factory-trained and certified to install and program all aspects of the system. Where specialized individuals are required to perform specific functions, such as configuration of the NEC Express cluster software, these individuals shall be certified by the manufacturer for the task being performed. Certifications shall remain intact throughout the warranty period. The Contractor shall maintain a fully staffed office within one (1) hour travel time from ANC until completion of the project warranty.
- D. Personnel:
  - 1. Personnel shall be qualified to accomplish all work promptly and satisfactorily.
  - 2. Personnel shall have attended the manufacturer's training school(s) for equipment being serviced. Provide certificates of completion or other documentation showing manufacturer certification.



3. The Department shall be advised in writing of the names of the designated project personnel and of any change in personnel during the course of the project.
4. The Department reserves its right to have any personnel removed from the project for non-performance and/or not meeting the requirements specified herein.

## 1.9 WARRANTY AND SERVICE

- A. Warranty shall commence in accordance with the final completion date and shall not be a function of material delivery dates.
- B. Warrant all components, parts and assemblies against defects in materials and workmanship for a period of 12 months from **final** completion. Warranty service shall be provided by a trained specialist of the equipment manufacturer.
  1. Warranty response time shall not exceed **two (2) hours**. If the Contractor fails to respond to the service request within the specified time, ANC will have the right to repair the system without invalidating the warranty. In the event the ANC effects repairs because of Contractor non-response the Contractor will be charged for the repair cost and the established warranty shall remain intact.
- C. Service/Maintenance:
  1. Maintenance and repair of system or workmanship defects during the warranty period shall be provided by the Contractor free of charge (parts and labor).
  2. The installer shall correct any system defect within **four (4) hours** of receipt of call from the Department.
  3. Extended service/maintenance agreements shall be offered by the Contractor for up to four years after the warranty expires. The agreement shall be renewable quarterly or yearly. Submit 90 days prior to final inspection.
- D. Inspections: Perform two inspections accompanied by airport maintenance technicians at six-month intervals, or more often if required by the manufacturers. Notify the Airport of inspections 72 hours in advance of inspections. This work shall be performed during regular working hours (7:30am-3:30pm), Monday through Friday, excluding federal or state holidays. These inspections shall include:
  1. Visual checks and operational tests of the system.
  2. Perform diagnostics on all equipment as needed.
  3. Resolve previous outstanding problems.
- E. System operation verification: Performance of scheduled adjustments and repair shall include verification of operation of the system as demonstrated by the applicable tests upon completion of work.

- F. System modifications: Make all recommendations for system modification in writing to the Department.
  - 1. No system modifications, including operating parameters and control settings, shall be made without prior approval of the Department's designated representative.
  - 2. Modifications made to the systems shall be incorporated into the operations and maintenance manuals, and other documentation affected.
- G. Software Upgrades: One month prior to completion of the warranty provide upgrades to the latest version of software available from the manufacturer for all software installed as part of this project. Upgrades shall include all software patches, service packs, etc. available from the manufacturer. Submit list of upgrades available for approval by the Department prior to installation.

#### **1.10 KEYS AND KEY-LOCK SWITCHES**

- A. Locks installed on system enclosures shall match existing enclosure locks at ANC and shall be keyed alike and all keys shall be furnished to the Department after system final acceptance.
- B. Construction Locks: If the Contractor requires locks during installation and construction, a set of temporary locks shall be used, with 3 keys provided to the Department.
- C. Keys shall be controlled in accordance with the Department's key control plan.

#### **1.11 EXTRA MATERIALS**

- A. Unless stated otherwise provide the following quantity of extra materials:
  - 1. Access Controller (DBC) with Power Supply – 10
  - 2. Auxiliary Boards (Daughter, Input, Output, Interface, and Communications Boards) – 10 of each type utilized for installation of the system
  - 3. ACS Alarm Workstation with all required hardware, software and licenses – 2
  - 4. ID Badge Workstation with all required hardware, software and licenses – 2
  - 5. ID Badge Production Material – Refer to Section 13710-2.10.B and 2.11
  - 6. Contactless Smart Card Reader – 5 of each type utilized for installation of the system
  - 7. Biometric Reader (field) – 2
  - 8. Biometric ID Badge Enrollment Reader – 1
  - 9. Identification Scanner – 1
  - 10. ID Badge Printer - 2
  - 11. Horn/Strobe Device – 10
  - 12. Electrical Door Hardware - 2 of each type utilized for installation of the system
  - 13. Electrical Door Hardware Power Supply – 10

## **PART 2 - PRODUCTS**

### **2.1 ACCEPTABLE MANUFACTURERS**

#### **A. Product Basis of Design:**

1. Basis of Design refers to products around which the design was prepared. Some or all of the particular characteristics of Basis of Design products may be critical to the fit or performance of the completed installation. Such characteristics are often subtle. Where substitutions are made to products that are the Basis of Design the Contractor is alerted that nominally acceptable substitutions may produce undesirable side effects such as equipment that no longer fit the space due to increased product dimensions. The Contractor is responsible for resolving all impacts of substitutions. Approval of a substitution request does not relieve the Contractor of complying with the design intent and all Codes.
2. Reference to a specific manufacturer's product (even as "Basis of Design") does not necessarily establish acceptability of that product without regard to compliance with all other provisions of these specifications.
3. Access Control System:
  - a. Security Management System Software: AMAG Symmetry Homeland Security Edition, unlimited readers and workstations with NEC Express Cluster X Aware.
  - b. Access Controller: AMAG M2150 8DBC Series Controller
4. Acceptable Substitutions:
  - a. Named manufacturer is the basis of design for the system.
  - b. The following manufacturers are acceptable substitutions for the above referenced basis of design provided the system solution proposed fully complies with the specification requirements and functionality. No other manufacturers are approved.
    - 1). Hirsch
    - 2). Lenel
  - c. Submit product literature and a complete compliance checklist showing compliance with individual specification paragraph performance requirements in accordance with Section 01630 - Substitutions and Product Data.

### **2.2 GENERAL SYSTEM REQUIREMENTS**

- A. Provide a new integrated Security Management System (SMS) with a simple and easy-to-use graphical user interface (GUI). The system shall provide local operational control and monitoring of all access control input and output points.
- B. The SMS shall be provided with all required software and software licenses to support an unlimited number of access controllers, card readers, biometric readers, and alarm and management workstations.
- C. The system shall be UL listed and shall meet the requirements of UL-294.

- D. The SMS workstation and server software shall be used in conjunction with intelligent controllers to provide a distributed access control system (ACS). In the event of a communications failure between the host server and the field controllers, the controllers shall continue to make local access control decisions and save all transactions in memory until communications are restored. Upon restoration of communications the controller shall upload all stored transactions to the server.
- E. The SMS shall integrate the functions of access control, alarm monitoring and response, digital video imaging, badge design/creation, and visitor management. All SMS components shall run on an integrated application environment as part of a single application.
- F. The SMS shall have the capability of reading multiple credentials issued to meet the FIPS 201 and Trusted Worker Identification Credential (TWIC) standards and the Government Smart Card Interoperability Specifications (GSC-IS). Use of a FIPS 201 or TWIC compliant reader connected to standard hardware and software shall not be acceptable.
- G. The SMS shall incorporate specialty software and hardware, and shall support the encoding of ANC's existing iClass Corporate 1000 smart cards via the ID Badge printers provided as part of this project.
- H. The SMS shall be integrated with ANC's existing Verint Digital Video Recording System (DVRs), Vicon Closed-Circuit Television (CCTV) System and Zenitel Intercom (IC) System.

### **2.3 SPECIALIZED ANC SYSTEM REQUIREMENTS**

- A. ACS interface with CCTV System (Refer to Article 3.4.A)
- B. ACS interface with DVRs (Refer to Article 3.4.B)
- C. ACS interface with Intercom System (Refer to Article 3.4.C)
- D. In-line ID Badge Printer HID Smart Card Encoding (Refer to Article 2.5.M.9 and 2.5.JJ.1)
- E. Single Sign On Biometric Solution (Refer to Article 2.5.L.2 and Section 16749-2.4.C)

### **2.4 REDUNDANT COMMUNICATIONS (ADDITIVE ALTERNATE NO. 1)**

- A. As part of the bid provide a cost on the bid form for the provision of a secondary communications method between the access controllers (DBC's) and the SMS. The primary method shall be Ethernet communications as specified herein and detailed on the Contract Drawings. The secondary method, at the Contractor's option, shall be via RS-232, RS-485 or 20mA serial communications. The Contractor shall install new 3/4 inch conduit in a loop configuration between the access controllers and associated Telecom Rooms (TRs). Contractor shall utilize

existing singlemode and/or multimode cabling for communications between the TRs and the SMS headend. At a minimum the secondary communications protocol shall allow alarm events to be communicated to the SMS. Use of media converters for implementation of the secondary communications method is acceptable provided the units utilized have the ability to be remotely reset. All required equipment, software and labor shall be included in the additive alternate price. Submit detailed shop drawings for approval to the Department detailing the implementation of the secondary communications method if the additive alternate is accepted.

## **2.5 SECURITY MANAGEMENT SYSTEM SOFTWARE**

- A. General: The following software features shall be provided as part of the ACS including all required software and software licenses.
- B. The SMS shall start up as part of the Operating System (OS). The SMS shall run as a service in the OS, and there shall be no requirement to run an application after the OS is ready.
- C. The SMS shall be configured with a Graphical User Interface (GUI) as specified herein which minimizes training needs for the operators. The software shall include on-line help displays to eliminate operator reference manuals.
- D. The SMS software shall operate using standard x86-based hardware utilizing the following software applications:
  - 1. SMS servers shall run on Windows Server 2003® Standard or Enterprise Edition as required.
  - 2. SMS clients shall run on Windows XP Professional®.
  - 3. System shall meet Microsoft requirements for "Designed for Microsoft Windows 2003 Server" and "Designed for Windows XP".
  - 4. The servers shall utilize Microsoft SQL Server 2005® database server. The SMS shall allow other authorized applications to gain access to the system's database should wider integration of the system at ANC become a requirement.
  - 5. The SMS shall use Microsoft Message Queue® (MSMQ) for handling transactions between server and clients as well as between server and field hardware. Use of first-in-first-out (FIFO) buffers shall not be acceptable.
  - 6. The SMS servers shall communicate to all clients (operator workstations and field hardware) through WIN32 services. The SMS server shall not require that an application be run for proper system operation.
  - 7. The SMS shall support Windows TimeSrv or Windows time management to support Windows daylight saving auto adjustment.
  - 8. The SMS shall synchronize its time with ANC's existing Masterclock Model NTP100-GPS Network Time Protocol Server.
- E. It shall be possible to select any function, within a given operator's permission, independent of the currently displayed screen. Functions shall be accessed via tool bar icons, which shall include Help prompts that shall appear when the

mouse pointer dwells on the selection button. It shall also be possible to link any standard Windows application to a custom toolbar icon.

- F. A print screen command icon shall be provided, subject to an individual operator's permission, for all screens and shall allow the currently displayed information and screen presentation to be printed.
- G. The SMS shall support an unrestricted number of time codes and a minimum of 10 intervals per time code.
- H. The SMS shall support an unrestricted number of time intervals. A time interval is a defined span of time such as "08:00 to 17:00" as "Business Hours". Time intervals shall be permitted to span midnight, such as "20:00 to 05:00" as "Third Shift".
- I. The SMS shall be scalable to a multiple-server implementation where each region (either geographical or logical) has a server capable of making local decisions and configuration changes. The Global head-end server responsible for managing the entire enterprise including all regional servers shall support a minimum of 999 regional servers.
- J. High Availability and Disaster Recovery:
  - 1. Database redundancy software shall be installed so that in the event of a database server failure, the ACS workstations will, without operator intervention, automatically connect to the backup server. Failback to the primary server shall be configurable as automatic and shall not require manual actions to be performed to accomplish. For this project the Contractor shall configure the failback to the primary server as manual. This shall enable the Department to determine the cause of the failure and fail the SMS back as desired. The reason for this is so that if the primary server is having intermittent problems and going on and offline the SMS will not continue to failback and forth.
  - 2. The SMS shall utilize NEC Express Cluster Version X software providing a 99.99% availability solution which shall allow the SMS the ability to continue to operate without interruption, while the cause of the main server failure is investigated.
  - 3. Ethernet edge switches independent from the ANC IT LAN shall be provided with dual GBIC uplinks to provide a heartbeat between the primary and secondary database servers. Refer to Specification 16749 for the Ethernet Switch specifications and the Contract Drawings for the redundant configuration.
- K. Encryption:
  - 1. Communications encryption between the workstations and servers over the LAN shall be 3DES encryption.
  - 2. Communications encryption between the access controller and the servers shall be AES encryption.

3. Web-based (thin client) SMS clients shall utilize 128-bit SSL encryption.

L. Operator Permissions:

1. System operators shall be associated with a login Name and Password. A system option shall determine whether strong operator passwords are used. The minimum definition of a strong password shall be a password that contains at least one upper case character, one lower case character, one numeral and one punctuation mark, with a minimum password length of six characters. Additionally, the password cannot contain any full word of the operator's username.
2. A secure Fingerprint Biometrics for system sign on shall be provided. This shall require the operator to present their name, password and biometrics for a single sign on solution to sign on to the workstation. Upon sign on the operator shall have access to all workstation and network applications the individual has access too.
3. Operators shall be assigned to permission profiles. This shall determine the functions that are available to that operator when logged onto the system. Each operator shall only have the ability to see the functions for which they have access. The SMS shall hide Personal Identification Numbers (PINs) of cardholders when an operator is viewing a record. Coordinate operator privileges with the Department.
4. Card record data entry shall be divided into operator permission areas, allowing separate permission categories to be assigned for the viewing of personal data, ID badge printing and access rights management.
5. The SMS shall support an unrestricted number of operators and operator permission profiles.
6. For all operators, a means of re-arranging their Icon tool bar shall be provided to allow the most frequently used Icons to be repositioned by the operator.
7. The SMS shall store operator preferences based on logon information. This feature shall allow an operator to work with their preferred configuration independent of which workstation they occupy.

M. Video Imaging and ID Badge Printing:

1. The system shall support the specific requirements for badge design in FIPS 201. These include, but are not limited to:
  - a. The ability to print on the front and back of the card.
  - b. The ability to mask off the contact chip area from printing.
  - c. The ability to include User-Defined database fields such as issuing agency, security clearance, etc. in the badge design.
  - d. The ability to have multiple graphics in the design.
  - e. The ability to rotate text.
2. The SMS shall incorporate video imaging as a fully integrated function to customize access control credentials by printing an identity badge directly onto the card.

3. For each cardholder both a facial image and a signature shall be able to be captured, or imported, and stored as part of the card record. These images shall be captured from a digital CCTV camera connected to the computer via a USB port or imported as a bit map or JPEG file. The SMS shall use data compression techniques to ensure efficient use of the available hard disk space to maximize the number of images that can be stored on the servers.
4. The SMS shall support the importation of a signature from a signature capture terminal connected to the system via an RS 232 communications port of the client workstation local to where the card is being issued.
5. A comprehensive integrated badge design facility shall also be provided, allowing an unrestricted number of custom badge layouts to be defined and saved with a suitable description as a reference. This shall make full use of the card record details such as name, card number, inactive date as well as allowing personal data to be included in the badge design. Airport logos shall be imported as bitmaps or JPEG images to provide a personalized appearance to the card. All elements incorporated into the design shall be able to be rotated.
6. The badge design shall support a double-sided design. Each side of the card shall also be designated as being blank, or magnetic stripe side, or smart chip side, to ensure the designer is aware of the available space where printing may be incorporated for each card combination. The badge designer function shall be capable of supporting portrait, landscape, standard and custom-sized card designs.
7. When creating a new card record a badge preview screen shall also be included that displays the specific card's details on the selected badge design to allow confirmation prior to requesting the badge to be printed.
8. Each new cardholder record shall have the option to be flagged for future printing. Cards flagged in this manner shall be easily recalled at a later stage and processed for output to the printer in a single action. Selecting multiple cards for bulk printing shall also allow each card to be printed either with its specific badge design, as defined within each card's record, or alternatively printed with a selected common badge design. The SMS shall support any manufacturer's ID badge printer with a Microsoft Windows XP compatible printer driver.
9. The SMS shall have the option to encode a smart card via the ID Badge printers during the print cycle.
10. Each badge design shall include a default printer, validity period, and access rights.

N. Report Generation:

1. Extensive history reporting shall be a standard integrated feature and shall include the ability to review all system alarms, access control activity, and operator actions. These reports shall be made available for review via the operator's display screen, printer, or disk media. Extensive sort parameters shall include any of the "Personal Details" fields or Titles, for example by "Department", and only Names commencing with "SM\*".



2. The system shall support generation of reports detailing the system operation. The following canned reports shall be available in the software:
  - a. Cards on site
  - b. Hours on site
  - c. Cardholders with access to each door
  - d. Access rights of each cardholder
  - e. System Configuration
  - f. Scheduled and Conditional Commands defined
  - g. System operator transaction history
3. It shall be possible to replay video clips associated with alarm events by directly interacting with the report as published to the computer screen.
4. The SMS shall have the ability to export data to other standard office word processing packages such as Microsoft Word®.
5. The SMS shall provide system management reporting, including detailed listings for all the operator actions and the current cardholder database for output to the display screen, printer or disk media.
6. The SMS shall have the ability to save frequently used report configurations and associate them with a "Title". Such predefined reports shall be available from a list to simplify the report selection. It shall be possible to request these reports to run immediately or schedule them to occur at a specified date and time.
7. Scheduled reports shall additionally have the option to be automatically repeated by specifying the number of days and reporting period to be included, for example a weekly report of alarms to run at 10:30 am each Monday and including the previous seven days of alarms.
8. The SMS shall allow custom reporting options by providing an interface to Crystal Reports. The interface shall present all database fields in a structured format, which does not require detailed knowledge of the database design and table relationships. Provide three fully licensed copies of Crystal Reports Professional Edition, Version 11 and develop 40 custom reports for ANC utilizing this software. Coordinate the custom report parameters and requirements with the Department.

O. History Reporting:

1. Reporting capabilities shall provide the ability to review all system alarms, access control activity and operator actions. These reports shall be available for review on the operator's display, to a printer, or to a file.
2. Sort parameters shall include any of the personal details fields of information associated with each cardholder such as individual name, department, job title, company name, etc.
3. Report configurations shall be saved allowing them to be selected and run on demand, or scheduled to run automatically as required. When scheduled to run automatically this shall have the ability to be repeated.
4. Total Hours Spent On-Site: This report shall provide a detailed audit of the arrival and departure times for cardholders and calculates the total time spent

on site for the chosen reporting period. This report shall be filtered by any of the personal data fields of information associated with each cardholder.

5. Cards On-Site Reporting: This report shall provide a list of cardholders currently on the site. This may be for all persons within the site or just who, for a particular department or a particular contractor company, is currently present. The report may also be run to cover just a part of the site, for example, cardholders in a particular building or room.

P. Clients:

1. The SMS shall support an unrestricted number of clients. The SMS shall provide the means for multiple operators to simultaneously administer the SMS from convenient locations connected via the local area network (LAN).
2. Clients shall not use mapped drives for server connections.
3. Clients shall not use UDP messaging.
4. SMS shall support a minimum of two client PC monitors per workstation. The SMS shall additionally store the last position and size of all open dialog boxes and screens upon exiting the application on a per operator basis. Upon relogging onto the application by the operator the screen positions shall be restored. Such operation shall be independent of which workstation the operator uses.

Q. Access Groups and Rights:

1. The SMS shall provide a means of creating and assigning access control rights and groups to each cardholder. Access control rights and groups determine which access points are accessible to the cardholder based on date and time of day. Access control groups can be assigned to an individual based on the creation of an access code which contains access groups based on company name, department and job title. The SMS shall support an unrestricted number of access rights. Coordinate the development of new access groups for ANC and program all new access groups for the new system.
2. The SMS shall also have the ability to provide an alternate set of access groups to a cardholder on a temporary basis. The change may be initiated at any time by an authorized operator, or automatically between specified dates. This shall provide the facility of automatically changing a card's rights between a specified date range, after which the card will revert to its normally assigned access groups. Alternate access rights shall be able to be configured for multiple date ranges.
3. Each cardholder shall either be associated with standard door alarm shunt timing, for door release and door hold open shunt time or shall be given extended hold open timings for disabled persons, maintenance, janitorial staff, etc.
4. Cardholders who have not used a reader for some time shall be readily listed to allow their card's status to be reviewed. An additional feature shall allow cardholders to be automatically set inactive and therefore access denied

should the card have not been presented at any reader on the system for a defined number of days.

5. Cardholders shall be assigned an expiration date, and more specifically an expiration time, after which a card shall automatically become inactive and therefore be rejected at all readers on the system. The SMS shall have the ability to be configured to automatically purge expired cardholder records after a configurable number of days from the date of expiration.
6. The SMS shall allow for the definition of access control rights to be associated with a badge design. Each user that selects that badge design shall be provided with the associated access control rights that can further be customized for the specific cardholder.
7. The SMS shall allow access control rights to be defined for a cardholder on a reader basis. A time code will be associated with each reader as it is assigned to the cardholder's access control rights.
8. The SMS shall allow access control rights to be defined for a cardholder on an access control group basis. Access control groups are groups of readers. A time code will be associated with each reader group as it is assigned to the cardholder's access control rights.
9. The SMS shall allow access control rights to be defined for a cardholder on an access code basis. An access code is a group of access control rights.
10. The SMS shall have a note field associated with each cardholder record. The note field shall be free form text and shall support a minimum of 256 characters. The note field shall further support the ability to attach a file (of any type or size) to the cardholder record.
11. When viewing a cardholder record the last twenty-five (25) valid door access transactions shall be displayed to help locate a cardholder.
12. The SMS shall support a field for assigning an approving official to the cardholder record that defines the individual who authorized the assignment of a credential. Approving officials shall have an associated validity period and image of their signature. As an option, the assignment of an approving official shall be mandatory.
13. The SMS shall allow the user to enroll biometric data as part of the cardholder enrollment process. The number of verifications to determine applicability of the enrolled biometric data shall be configurable.

R. Cardholder Details:

1. Cardholder information shall include first, middle and last name, card number, PIN code(s) and valid period to provide automatic expiration. Each cardholder record shall also incorporate at least 50 user-defined personal data fields, independent of user-defined fields for visitor management. Personal data fields shall have the option of being configured as mandatory.
2. Coordinate all required user-defined data fields with ANC and develop the ID badging operator screen to meet ANC's desired presentation and data field requirements. Submit color screen samples to the Department 60 days prior to the start of the database duplication process on-site.

3. The cardholder record shall have the ability to include each field of the FASC-N data (as defined in FIPS 201 and supporting documents NIST SP800-73-1 and NIST SP800-78). Agency code, system code, and credential number shall not be concatenated.
4. An identification scanner shall be provided at each Identification (ID) Badging Workstation to simplify data entry of cardholder information. The scanner support shall include the ability to automatically read, through optical character recognition (OCR), the most common fields from valid and authenticated driver's licenses issued by all 50 states and United States of America passports; and populate these fields into the appropriate user-defined personal data fields in the cardholder record.
5. Data entry shall be simplified by remembering previous entries of personal data and allowing selection from a pick list to minimize repetitive typing when creating each cardholder's record. The cardholder database and the history log shall also be sorted by any of the additional fields of information providing a tool for filtering data.
6. Personal data fields shall support free entry text, picking an entry from a previously configured list, or picking an entry from an updateable list. Each of these entries shall further be categorized as a date, a time, general input, or customized input. Each category shall support the masking of input data to assure data integrity. For example, a date mask might look like "mm/dd/yyyy" to indicate that the date input should be a two-digit month followed by a two-digit day followed by a four-digit year all separated by the slash character. The mask shall be required for customized input.

S. Locator:

1. The SMS shall provide a quick method of locating cardholders by displaying the last 25 valid history events along with the time, date and access point used. This information shall be available for an individual or group of persons by name, card number or by personal data.

T. Card Watch Feature:

1. Any cardholder shall be easily tracked as they move around the Airport by selecting card watch. As the person uses their access control card, the system shall have the ability to automatically notify the operator of the person's presence at each location.

U. Serial Device Interface:

1. The SMS shall allow the definition of ASCII commands to be sent out over a computer serial port (physical or virtual) or through the RS-232 interface of the DBU. These serial commands shall be available through the user interface to allow for interfacing with existing and new systems for alarm video and intercom call-up, etc. system functionality specified herein.

V. Automatic Holiday Override:

1. The SMS shall be programmable by the operator to recognize special or holiday dates, which in turn can be linked to operational changes in how the site is managed on these specific days. This feature shall notify a system operator of individual holiday dates up to seven days prior to provide a useful check on the date's current validity. Multiple types of holiday dates shall also be provided so that partial days or early closing requirements on specific dates can be accommodated.
2. The SMS shall provide a calendar function to enable scheduling of events up to five (5) years into the future.
3. The SMS shall provide the ability to schedule one-time events for up to five (5) years into the future.

W. Alarm Management:

1. Alarm handling shall be managed with up to 99 priority levels and user definable instruction messages to ensure the operator monitoring the Alarm Workstation takes appropriate responses. The Airport shall have the ability to customize audible alerts for each type of alarm utilizing standard or custom generated multimedia wave files. Each alarm type shall also be presented in a user-defined color. Coordinate all audible alert tones with the Department.
2. The operator shall have the ability to enter custom comments or simply select from a predefined pick list to provide a time-stamped record of all the actions taken throughout the incident. Predefined manual commands shall be uniquely assigned for each alarm, and readily activated by the operator via a command button provided on the alarm acknowledgement screen. Additionally, automatic conditional commands shall be configured to automatically operate in response to any given alarm condition.
3. The SMS shall have the ability to be configured to require operator comments when acknowledging alarms. Coordinate implementation of this feature with the Department.
4. The SMS shall have the ability to selectively choose alarms to acknowledge and/or clear.
5. Each alarm shall be configurable to have a specified color and sound.
6. The operator shall have the ability to play video from digital video recorders for incident playback.
7. The Alarm Monitor screen shall provide an indication that cardholder information is available for a specific alarm. A "Card" button shall be available that when pressed will display the cardholder badge image.
8. Alarm monitor screens shall support the display of alarm statistics, provide up to ten alarm filters to be displayed in different tabs on the alarm screen, and shall provide the ability to sort based on each different column.
9. Each alarm shall be time-stamped in the local time zone. The label for time zone shall be customizable.
10. The SMS shall permit the routing and display of real time activity at any Alarm Workstation. Activity shall be shown in a dedicated activity window

that is updated automatically when new transactions occur. This option shall not be limited to routing transactions to one location and shall support the simultaneous routing and display of real time activity at multiple locations.

11. Alarms shall be capable of being routed to a specific Alarm Workstation based on time of day or day of week.
12. Unacknowledged alarms shall be capable of being routed to alternate Alarm Workstations or Email based on age and priority of alarm.
13. The display of alarms shall be automatically enabled or disabled by the use of timed commands, either by reader or by a group of readers.
14. The SMS shall support a generic ASCII input capability that allows the system administrator to define specific ASCII input strings as alarms to be displayed in the alarm monitoring window as well as on the graphical map interface.

X. Graphical Site Maps:

1. The SMS shall have graphical maps to speed the location of an incident, each map level shall contain a clearly visible indicator as to which sub map the operator should select next to find the device that is in alarm. Maps shall be linked together using a tiered tree structure.
2. Drawings in AutoCAD® latest version or as coordinated with the Department format will be supplied by the Department for use in the development of the graphical maps. Customize these drawings to include the various security icons, intercom icons, CCTV camera icons, designators, etc. and to depict the overall site plan as well as sub-maps that depict the floor plans within individual buildings, floors, rooms, etc. Coordinate the development of the graphical maps with the Engineer and the Department. Modify the AutoCAD drawings deleting any superfluous information to produce high quality graphical maps. Scanned or blurred graphical maps shall not be acceptable.
3. Maps shall have the ability to be configured to appear automatically on presentation of a new alarm, providing the operator with prompt visual indication that an alarm has occurred.
4. The status of card readers, doors, input points and auxiliary outputs shall be requested from any map by simply selecting the icon representing the device allowing its current state to be displayed.
5. The icons on the graphic maps shall dynamically indicate the status of the device they represent. For example, a door icon shall change state to depict the door open when the door position sensor indicates such, and the icon shall change to the original state when the door is again secure. Monitor points shall also change to show their current state.
6. The operator shall have the ability to change the current state of a control point by pressing the right mouse button which will cause the appropriate command options list to appear for selection. Having selected a command, confirmation shall be provided by reflecting the change in status on the display.
7. Maps shall be created using standard office tools such as Paint® or drawing packages such as AutoCAD®. It shall be possible to import drawings in the

- following formats: JPEG, Bitmap, Windows metafile or DWG. Windows metafiles and AutoCAD® formats shall be utilized for this project.
8. Icons representing access points, monitoring points, switching outputs, alarm inputs, CCTV cameras, duress buttons, and intercom stations shall be placed on the maps at the required location in a drag and drop manner.
  9. The map display shall allow the operator to switch the video of any defined CCTV camera to any defined CCTV monitor. The map display shall allow the display of stored and live digital video.
  10. It shall also be possible to change the status of card readers, card reader groups, floor groups, alarm monitored points or output switching relays and confirm the successful execution of such commands from the maps. This functionality shall be capable of being restricted per device based on operator permission.
  11. The map displays shall have the ability to display a group of similar devices as a single icon. Once devices are grouped it shall be possible to change their status. For example, it shall be possible to unlock all entrance doors by executing a single command from the map display.

Y. Manual and Automatic Commands:

1. Operators shall be provided with numerous choices of manual commands for control of card readers, monitor points, output switching relays and door locking devices. The operator shall have the ability to check the status of single or multiple devices. This shall ensure the operator is always able to check the operational status of the system and make any adjustments as requirements change. On the graphical maps status requests shall be initiated by "clicking" on the device icon within the map. This functionality shall be capable of being restricted per device based on operator permission.
2. Automatic commands shall be included and shall operate on a timed or event basis. Scheduled commands shall easily be defined linking complimentary commands to occur at the start and stop times of any chosen time code.
3. Event triggered commands shall provide a means of creating IF/THEN/WHEN associations encompassing a wide selection of IF conditions to the automatic execution of THEN commands, subject to a WHEN time code being active. A minimum of 10 THEN actions shall be available per trigger command.
4. Devices shall be managed on a partition basis by grouping card readers, monitor points and auxiliary outputs. This feature shall allow multiple devices to be actioned by a single command when using manual, timed and conditional commands. This functionality shall be capable of being restricted on a per device basis based on operator permission.
5. The SMS shall support an unrestricted number of automatic (scheduled and trigger) and manual commands. These commands shall be capable of spanning across multiple field controllers.

Z. Card Initiated Commands:

1. The SMS shall allow authorized cardholders to initiate trigger commands manually from selected card reader locations when used in conjunction with the access controller.
2. Up to 99 predefined commands shall be invoked by an authorized card allowing, for example, an individual to switch on outputs, disable monitor points, lock doors, and extend door hold open times.
3. The SMS shall only permit authorized individuals to enter command codes at card readers with PIN pads. Such authorized individuals shall not be restricted as to when or where they can enter a command code. Time restrictions, however may be placed on the commands themselves.

AA. Visitor management:

1. Visitor Management shall be incorporated as a standard feature of the SMS. Provide ANC with two physically complete and functional Visitor Management Workstations. The Visitor Management Workstations shall be installed within the Concourse C Reception/Waiting Area Room C3980 and the Reception Room C4987. These workstations shall be connected to the ANC LAN over existing CAT5e horizontal cabling. Operators shall be able to pre-enroll visitors using a Web (thin) or Standard (thick) client application. The thin client shall connect to the server via Microsoft™ Terminal Services and Microsoft™ Internet Explorer to permit any operator with visitor permissions assigned the ability to pre-enroll visitors without the need to install client software on their local machine.
2. The Visitor Management System shall allow for the issuance of preprinted visitor badges with predefined access rights which can be enabled upon issuance to the visitor. Visitor badges shall be disabled within the system upon return receipt of the credential or shall expire every evening at a programmable time by the Department.
3. Visitor Management shall be fully integrated with other key areas of the SMS, such as access, alarms management and ID Badging. Visitor records shall have 50 personal data fields with user definable data titles independent from the personal data fields defined for cardholders. All visitor transactions and movements shall be recorded and may be reported on and filtered, using the reporting capabilities of the SMS. Visitors may be defined within the SMS without being assigned a card number if access control is not required.
4. Coordinate all required user-defined data fields with the Department and develop the Visitor Management operator screen to meet ANC's desired presentation and data field requirements. Submit color screen samples to the Department 60 days prior to the start of commissioning of the management enrollment process on-site.
5. Data entry shall be simplified by remembering previous entries of personal data and allowing selection from a pick list to minimize repetitive typing when creating each visitor's record. The cardholder database and the history log shall also be sorted by any of the additional fields of information.



6. Personal data fields shall support free entry text, picking an entry from a previously configured list, or picking an entry from an updateable list. Each of these entries shall further be categorized as a date, a time, general input, or customized input. Each category shall support the masking of input data to assure data integrity. For instance, a date mask might look like "mm/dd/yyyy" to indicate that the date input should be a two-digit month followed by a two-digit day followed by a four-digit year all separated by the slash character. The mask shall be required for customized input. Personal data fields shall have the option of being configured as mandatory.
7. Visitor time of arrival and time of departure shall be tracked by the system. This feature shall be available even if a visitor is not issued a card or card number in the system.
8. A driver's license scanner shall be provided at each Visitor Management Workstation to simplify data entry of cardholder information. The scanner support shall include the ability to automatically read, through optical character recognition, the most common fields from valid driver's licenses issued by all 50 states; and populate these fields into the appropriate user-defined personal data fields in the cardholder record.
9. The SMS shall support the inclusion of a custom message for each visitor record.

**BB. Device Configuration:**

1. The SMS shall support a notes field to be associated with each device configured on the system. The notes field shall be free-form text, and shall support a minimum of 256 characters. The notes field may be used for detailed device descriptions or for maintenance history. The notes field shall also allow files to be associated.
2. The SMS shall provide a hierarchical tree view of the system configuration supporting expansion and collapse of any and all branches.

**CC. History Archive and System Back up:**

1. The SMS shall allow on line archiving of history logs, along with database backup of system configuration and cardholder details. This function shall be able to be automated to occur without intervention at a pre-set time.
2. The SMS backups and history shall be archived to the Airport's existing Network Appliance Network Attached Storage (NAS), Model FAS3050 via the network.

**DD. Support for Smart Cards and Biometrics:**

1. The SMS shall provide the ability to encode contactless smart cards with access control information. The system shall support encoding either HID iClass, Mifare, DESFire, or Dual interface PIV-II compliant cards.
2. The SMS shall be capable of capturing fingerprint biometrics and storing them on a contactless smart card, which will then be read and used to verify the cardholder during an access control transaction.

3. The SMS shall support the enrollment and use of at least two fingerprints, which shall allow the cardholder to present either finger to gain entry.
4. On a timed or manual basis the system shall be configurable to allow entry using the smart card only, smart card plus fingerprint or smart card plus two fingerprints, thereby raising or lowering the level of security as required.
5. The SMS shall allow the assignment of a fingerprint for normal entry and a different fingerprint for duress entry. The cardholder shall have the ability to trigger a silent duress alarm by presenting the duress fingerprint.
6. An option to recall the fingerprint acceptance threshold from the smart card to override the threshold stored at the reader shall be provided. By recalling the threshold from the smart card, overall site security is not compromised by a poor quality fingerprint, which would normally require a low acceptance threshold to be set at the reader.

EE. Anti-Passback:

1. The SMS shall support both "hard" anti-passback and "soft" anti-passback alarm reporting modes.
2. If the cardholder has access rights at a card reader, but creates an anti-passback alarm, a card reader configured as hard anti-passback sends an anti-passback alarm and denies access to the door/portal.
3. Soft anti-passback sends an anti-passback alarm, but still allows access through the door/portal.
4. The SMS shall support timed anti-passback. The principle of timed anti-passback is as follows: once a card has been used at a timed anti-passback card reader, the card causes an anti-passback violation if it is used again at the same or another timed anti-passback reader within a predefined period of time. The exception to this rule is when the anti-passback reader has been defined to be for an exit route. In this case, the card can be used at any time without causing an alarm or event. This allows for situations where a person enters an anti-passback-protected area, then wishes to exit the area immediately. The use of an exit anti-passback card reader also causes the time delay for reuse of the card to be zeroed, so in the example, the person can re-enter the anti-passback-protected area immediately, without having to wait. The delay can also be zeroed from the Card Holders screen or by means of an anti-passback command.
5. The SMS shall support zonal anti-passback. In the case of zonal anti-passback, the building needs to be partitioned into zones. For example, zone 1 may be the main lobby, zone 2 the computer room, etc. For each card reader that is defined as a zonal anti-passback reader, you can specify which zone of the building the card is going from and which zone it is going to. For example, the reader may allow a card to go from zone 1 (e.g. main lobby) to zone 2 (e.g. computer room). The SMS remembers which zone each card is in and updates this information whenever the card is used at a zonal anti-passback reader. An anti-passback alarm or event is generated if the card reader's from zone does not match the card's currently recorded zone. For example, an alarm or event is generated if the from zone of the reader is

zone 3, but the card is currently recorded as being in zone 1. If a card's currently-recorded zone and the actual zone get out of step, either because of some violation of the system (e.g. a person has previously climbed over a turnstile) or for a legitimate reason (e.g. a person has passed through a fire exit during a fire drill), some means is obviously required to bring the two back into step. This can be accomplished from the Card Holders screen or by means of an anti-passback command. Both methods put the card(s) into a "neutral zone", so that the next transaction at an anti-passback reader is always accepted without violation, and the reader's to zone becomes the card's new zone.

FF. Elevator Control:

1. Each cardholder shall have floor permissions assigned as part of the normal access rights. The system shall provide outputs to the elevator controls to control which floors are authorized for each cardholder. The SMS, via the DBC, shall enable floor and elevator call button operation based on the individual's access rights.

GG. Threat Level Manager:

1. The Threat Level Manager (TLM) shall provide the ability to make system-wide access right changes by simply changing the threat level.
2. The threat level shall be selected from one of five levels that can be labeled and defined by the user. Each threat level shall also have a specified color associated.
3. The present state of the SMS threat level shall be visible from any view within the software.
4. The SMS shall restrict the ability to change threat level to only the authorized operator(s).
5. The SMS shall allow the configuration option to require the approval of two authorized operators to change the threat level.
6. The ability to change the threat level shall be integrated into the site map by right clicking on an appropriate icon.
7. The SMS shall automatically disable access rights for individuals that have a threat level threshold below the selected level. The same access rights will automatically be enabled when the threat level changes to a level below their threshold.

HH. Digital Video Monitoring and CCTV Matrix Switch Control:

1. This SMS shall allow the operator to control ANC's existing Vicon CCTV matrix switching system, and view live video and playback of recorded video from ANC's existing Verint DVR system. The SMS shall allow the system administrator to configure the existing Verint DVR system. The SMS shall allow instant replay of recently recorded video from any DVR.
2. An operator with appropriate privileges shall be able to control the CCTV matrix switcher in order to display any available CCTV camera video on any available CCTV video monitor.

3. It shall be possible to recall and replay stored video clips associated with a selected alarm using the alarms management screen.
4. Live video from any camera shall be available and viewed within the SMS by right-clicking on an appropriate map icon.
5. The video components including CCTV cameras, monitors, and DVRs shall be included in management reports. Management reports are to include, at a minimum:
  - a. A tree view of all devices configured in the system.
  - b. Camera Configurations.
  - c. User audit trail of changes such as Who sent What commands that affected configuration (i.e. frame rate changes).
  - d. Reporting of trigger operations.
6. The video management module shall provide a graphical time and calendar tool for configuration of frame rate, resolution, pre-sets and other features.
7. Virtual Matrix: The SMS shall provide a "virtual matrix" interface that shall provide the following functionality:
  - a. Software PTZ controls (only displayed when appropriate cameras are selected).
  - b. Ability to view up to 36 video feeds (including cameras connected to DVRs or web interface to other devices).
  - c. Ability to select from at least 25 pre-configured screen layouts.
  - d. Ability to display active alarms in virtual matrix screen.
  - e. Ability to display real-time events in virtual matrix screen.
  - f. Provide a tree view of all cameras and other multimedia (such as web pages) configured in the system.
  - g. Ability to save screen configurations and to restore previously saved screen configurations.
  - h. Ability to perform a virtual guard tour by sequencing live video from various cameras into the main cell.
  - i. The live video management screen shall display software PTZ controls for those cameras that support such features through a TCP/IP software interface. The software shall also have a means of sending the PTZ camera to a pre-set position. At least 999 pre-set positions shall be supported by the Video Management software.
  - j. The video functions (live video display, instant replay of recently recorded video, playback of stored video, and configuration of the video functions) shall be available to any operator (with appropriate privileges) on any workstation connected to the system.
  - k. SMS shall provide (through the graphical map interface or through the virtual matrix) a means for an operator to quickly initiate recording on a specific camera (if not otherwise recording).
  - l. The SMS shall permit the operator to use drag-and-drop functionality to select cameras from the tree view of available sources and place them in desired positions on the virtual matrix. A double-click

operation shall display the video feed from the selected camera in the next available cell.

8. Video Playback: The SMS shall provide a video playback interface that shall support the following functionality as a minimum requirement:
  - a. Ability to replay up to four recoded video streams simultaneously in a 2 x 2 virtual matrix.
  - b. Ability to synchronize the video playback time of up to four recorded video streams.
  - c. A video playback time line will show the start and end time of the selected video stream
  - d. The video playback time line shall highlight any gaps in the selected video.
  - e. The video playback time line shall indicate in a different color any alarm activity that relates to the recorded video.
  - f. The video playback timeline shall show the alarm description and time when the mouse is positioned over the alarm in the timeline.
  - g. Ability to change the video playback speed to include the following options: 0.5x, 1x, 2x, 4x, 8x, 16x, 32x, 64x, and 128x normal speed.
9. The video management module shall support still image capture and export from the MPEG-4 video stream.
10. The video management module shall support the export of video clips to CD or DVD for archiving and for off-line review. The archived data shall playback on standard video viewers such as Microsoft Windows Media Player or Apple QuickTime Viewer.
11. The SMS shall limit operator access to video based on individual permissions.
12. Events received from the ACS, shall be capable of triggering video recording, to stop video recording, to display live video in the virtual matrix (or otherwise modify the view of the virtual matrix), and to display video playback.
13. The system shall allow the programming of event-based triggers to cause:
  - a. Live video from a named camera to be displayed in a particular cell of the virtual matrix,
  - b. Live video from a named camera to be displayed in the next available cell of the virtual matrix,
  - c. Reconfiguration of the virtual matrix display based on previously stored data,
  - d. Playback of pre and post event video.
14. Refer to Section 13710-3.4 for additional specialized functionality.

## II. Intercom Integration:

1. The SMS shall have a RS-232 serial interface to ANC's existing Zenitel Intercom System.

2. The intercom system shall be accessed by ANC Dispatch Operators via intercom master stations located adjacent to the SMS alarm workstations at locations as detailed on the Contract Drawings.
3. Currently intercoms are located at access controlled doors with delayed egress systems installed. Upon receipt of a delayed egress pre-alarm by the SMS, the SMS shall provide the operator the ability to open a bidirectional audio channel between the intercom and the alarm workstation associated intercom master station by clicking on an icon on the ACS Alarm GUI to assist in resolution and acknowledgement of the delayed egress pre-alarm. Upon acknowledgement of the alarm by the operator the SMS shall send a signal to the intercom system to disconnect the audio channel.
4. The SMS shall have the capability of receiving call requests from the intercoms to open a bidirectional audio channel between the intercom and the alarm workstation associated intercom master station. Call requests from the intercoms shall allow them to be answered and managed by using a dedicated screen within the SMS application - the View/Intercom Control Screen. The screen shall list all outstanding call requests, and allow the operator to communicate with the callers using simple screen buttons. The screen shall contain a command button that is associated with commands programmed for use with the intercom.
5. The SMS shall have the capability of initiating call requests from the SMS workstations to open a bidirectional audio channel between the intercom and the alarm workstation associated intercom master station. Call requests from the SMS shall allow them to be managed by using a dedicated screen within the SMS application - the View/Intercom Control Screen. The screen shall contain a command button that is associated with commands programmed for use with the intercom.
6. It shall also be possible to answer a call request by using the connect button in the Acknowledge Alarms Screen (if the call request is set up as an alarm) and from maps in the View/Maps screen.
7. Various alarm and/or event messages shall be associated with the use of the intercom interface. These shall be included in transaction reports generated by the SMS.
8. Refer to Section 13710-3.4 for additional specialized functionality.

JJ. Smart Card Encoding:

1. The SMS shall provide the ability to encode HID iClass® 13.56MHz 2 KByte contactless iClass® smart card (P/N 2002) with access control information via the ID Badge printers. The system shall support encoding of HID Corporate 1000 site code/card number and biometric information.
2. The SMS shall be capable of capturing fingerprint biometrics and storing them on a contactless smart card. This information shall then be read and used to verify the cardholder during an access control transaction.
3. The SMS shall support the enrollment and use of at a minimum two fingerprints. This shall allow the cardholder to present either finger to gain entry.

4. An option to store the fingerprint acceptance threshold in the smart card or at the reader shall be provided. By storing the threshold in the smart card, overall site security is not compromised by a poor quality fingerprint, which would normally require a low acceptance threshold to be set at the reader.

**KK. E-mail Alarms:**

1. The SMS shall provide the ability to automatically e-mail alarm condition messages.
2. Each alarm definition shall allow a destination e-mail address to be defined. The e-mail address may be an address group as defined in the e-mail MAPI application.
3. E-mail alarm messages shall be controlled by time of day and day of the week. For example, e-mail to the ANC Dispatch Supervisor would only be generated when alarms occur during after-hours times.

**LL. Thin Client Access:**

1. The SMS shall provide the ability for authorized individuals with thin client to access the SMS. The thin client interface shall utilize Microsoft Terminal Services to provide the same look and feel of the thick client to minimize training time and expense. The thin client shall be capable of the same functionality of a thick client with the exception of functionality that requires access to ports on the thin client computer.
2. The SMS shall provide the option of thin client access specifically for the VMS. The thin client interface shall utilize Microsoft Terminal Services to provide the same presentation of the thick client to minimize training time and expense. The thin client shall be restricted to Visitor Management functions.

## **2.6 ACCESS CONTROLLER (DBC)**

- A. General: The access controller shall be comprised of modular components that connect over standard interfaces to one another. These components shall consist of a database storage processor with integral door control unit (DBC). All DBCs provided on this project shall be AMAG multiNODE 2150 8DBC with all required daughter board(s), auxiliary input and output boards, Weigand Interface Module(s), and NIC Module.
- B. The DBC shall store firmware in non-volatile flash memory to allow for updates via the SMS head-end software application. The DBC shall store the cardholder and configuration database information in battery-backed up memory so that loss of primary power will not cause the loss of the database. Access granted or denied decisions shall be made in under 0.5 seconds.
- C. The DBC shall support 8 doors, expandable to 16, with a minimum configuration of 8 card readers, 48 monitored input points (32 auxiliary) and 24 monitored output points (8 auxiliary). Additional auxiliary input and output boards required to achieve a physically complete and functional system shall be provided as required.

- D. The DBC shall support a maximum configuration of 16 card readers, 56 monitored input points, or 56 auxiliary output points.
- E. The DBC shall be provided with all required interface and communications modules, enclosures, power supplies, daughter boards and auxiliary input and output modules as required for a physically complete and fully functional system as specified herein and detailed on the Contract Drawings.
- F. The access controller shall support the following supervision of the monitored input points with the 4-state supervision being the requirement for this project:
  - 1. 2-state supervision – in which only secured and alarm states are indicated.
  - 2. 3-state supervision – in which the state can be secure, alarm or trouble condition.
  - 3. 4-state supervision – supports secure, alarm, short circuit, and open circuit states.
  - 4. 6-state supervision – supports secure, alarm, short or open circuit for the sensor in addition to tamper alarm and tamper short circuit states.
- G. The access controller communications shall be Ethernet (100Base-T) with AES Encryption. Communications shall be fully functional during system and credential downloads. In addition, the controller shall support at a minimum one of the following communications protocols:
  - 1. RS-232
  - 2. RS-485
  - 3. 20 mA Current Loop
- H. Enclosure: The interior enclosure shall be a UL rated NEMA 12 style metal cabinet designed for surface mounting. It shall have a tampered, hinged door with a high security key lock (refer to Part 1.10 of this specification for lock and key requirements). Tamper switch shall have the ability to be disabled while working on the electronics within the enclosure. It shall have conduit knockouts to allow 3/4" to 1" EMT conduit to be used for cabling entry into the cabinet. Enclosure shall have a terminal strip to allow for disconnect of 120VAC power to the DBC for maintenance purposes.
  - 1. Enclosure shall be at a minimum AMAG Model CAB 5 or approved equal.
  - 2. Terminal disconnect shall be Entrelec Part No. 4/6.SNBT1 (Grey) with all required end caps and shield connectors, no substitutions.
- I. Standby Battery: The controller shall have an internal standby battery that is capable of running the system during AC power interruptions for not less than 1 hour. It shall be recharged by a charging circuit incorporated into the controller power supply board. The new electrical door hardware power supplies installed as part of the South Terminal Seismic and Security Retrofit Project No. 59016 and as part of this project shall be monitored for low battery status by the new access controller and annunciated as an alarm on the ACS Alarm Workstation.



- J. Fire System Interface: The system shall satisfy the requirements of NFPA 101.7.2.1.6.1 Delayed Egress Locks and 101.7.2.1.6.2 Access-Controlled Egress Doors. Loss of power to access control fire system interface that locks the doors shall automatically unlock the doors.
- K. Activation of the building fire-protective signaling system, automatic sprinkler, or fire detection system, shall automatically unlock the doors and the doors shall remain unlocked until the fire-protective signaling system has been manually reset. Per NFPA 101 activation of manual fire alarm pull stations shall not unlock the access controlled doors.
- L. Access controller shall be capable of supporting a minimum cardholder population of 100,000. In addition, the DBC shall be configurable to enable a learn mode in which if the cardholder memory is filled, new cardholders can still be added to the controller memory automatically by removing the cardholder with the oldest last access.
- M. Elevator Control: The system shall have the ability to provide elevator access control by the following:
  - 1. The use a card reader to activate the elevator call button.
  - 2. The use of a card reader in the cab to activate the correct floor selection button.
  - 3. A combination of both of the above functions.
- N. FASC-N data: The access controller shall have the ability to support the storage of FASC-N data. The cardholder record in the controller shall include each field of the FASC-N data (as defined in FIPS 201 and supporting documents NIST SP800-73-1 and NIST SP800-78). Agency code, system code, and credential number shall not be concatenated. The access controller shall interface with the card reader in a manner that provides all of the FASC-N data fields (as defined in FIPS 201 and supporting documents NIST SP800-73-1 and NIST SP800-78) from the card to the controller.

## **2.7 ACS SERVER**

- A. Provide rack mount servers for the ACS primary and secondary servers, communications servers and Domain Controller servers as detailed on Contract Drawings with the following characteristics:
  - 1. Physical: 2 RU Rack Mount
  - 2. Processors: Intel Xeon Quad Core X5450, 2x6MB Cache, 3.0GHz, 1333MHz FSB – Quantity 2
  - 3. Operating Software: Microsoft Windows Server 2003 R2 Standard Edition, at a minimum. If Enterprise Edition is required to meet the specified functionality provide at no additional cost to the Department.
  - 4. Database: Microsoft SQL Server 2005
  - 5. RAM: 4GB 667MHz (4x1GB), Dual Ranked DIMMs
  - 6. Power Supply: Redundant with Y Cord

7. Hard Drive Configuration: Integrated SAS/SATA RAID 5, PERC 5/Integrated
  8. Hard Drives: 146GB 15K RPM Serial Attached SCSI 3Gbps 3.5-inch Hot Plug, Quantity 3
  9. Optical Device: 24X IDE CD-RW/DVD ROM
  10. Communications: 2x Intel Pro 1000VT Quad Port Gigabit Ethernet NIC
- B. The ACS Server shall have the following Dell support:
1. Three year Gold Enterprise Support: 7x24 Hardware/Software, Escalation Management, 4hr 7x24 Onsite.
- C. Acceptable Manufacturer/Model shall be Dell Power Edge 2950.
- D. The State of Alaska has standardized on Dell products and as such no other manufacturers for this equipment will be accepted. The above specifications are the minimum requirements required for the project, however due to advances in technology servers which exceed the above specifications shall be acceptable.

## **2.8 ACS WORKSTATION**

- A. Provide ACS workstations with the following minimum characteristics:
1. Physical: Ultra Small Form Factor Mini Tower
  2. CPU: Intel Core Duo 2, 3.0GHz, 4M, 1333MHz FSB
  3. Operating Software: Microsoft Windows XP Professional
  4. RAM: 2GB DDR2 NonECC SDRAM, 667MHz (2DIMM)
  5. Hard Drive: 250GB SATA 3.0Gb/s
  6. Optical Device: 24X DVD+/- RW Drive
  7. Video Card: Intel GMA3100
  8. Monitor: 21-inch Flat Panel, see specification below.
  9. Mouse/Keyboard: Secugen Keyboard III, or approved equal and wireless Mouse. Keyboard and Mouse to be a unique color different from the other existing keyboards and mouse currently installed in the ARFF Dispatch Center. Coordinate color with the Department.
  10. Communications: Intel PRO/1000 MT Gigabit Ethernet LOM, 57Kbs modem
- B. The ACS workstation shall have the following ACS software applications installed:
1. Norton Antivirus, or approved equal.
- C. Acceptable Manufacturer/Model shall be Dell Optiplex 755.
- D. The State of Alaska has standardized on Dell products and as such no other manufacturers for this equipment will be accepted. The above specifications are the minimum requirements required for the project, however due to advances in technology workstations which exceed the above specifications shall be acceptable.

## **2.9 LIQUID CRYSTAL DISPLAY (LCD)**

- A. All ACS workstations and the 21-inch Dispatch CCTV CRT replacements displays shall be this type.
- B. Characteristics:
  - 1. Display – 24-inch Diagonal
  - 2. Pixel Pitch – .27 mm
  - 3. Resolution – 1920 x 1200/60 Hz
  - 4. Response Time – 6 ms
  - 5. Signal Input – DVI-D
  - 6. Contrast Ratio – 1000:1
  - 7. Video Input – RGB, S-Video, composite video, component video
- C. Acceptable Manufacturer/Model shall be Dell UltraSharp 2407WFP-HC, or approved equal.

## **2.10 KVM EXTENDER SWITCH**

- A. Provide a KVM extender as required to extend signals from the PC CPU to the system operator's location.
  - 1. KVM system shall consist of a local unit connected to the CPU and a remote unit located at the ARFF Dispatch operator's position.
- B. Use rack mounted KVM switches for CPU (local) interface.
- C. Each switch shall be dedicated to a system CPU and group of system control keyboards.
- D. Transmitter shall have the following connectors:
  - 1. 2 - USB
  - 2. 1 – DVI-I
  - 3. ¼" audio jack for audio
  - 4. ¼" audio jack for Mic
  - 5. RJ45 for interconnecting cable.
- E. Receiver shall have the following connectors:
  - 1. 4 – USB
  - 2. 2 – PS/2
  - 3. 1 – DVI-I
  - 4. ¼" audio jack for audio
  - 5. ¼" audio jack for Mic
  - 6. RJ45 for interconnecting cable.
- F. KVM extender shall use Category 5e unshielded, twisted-pair (UTP) cable as the interconnecting data transmission media from the local to the remote.

- G. Unit shall be compatible with the following operating systems: Windows XP Professional and Vista.
- H. Extender shall have controls for video equalization and gain.
- I. Video resolution: DVI-I.
- J. Keyboard and mouse emulation shall be plug-and-play.
- K. Acceptable Manufacturer/Model shall be Avocent ECMS2000U Series, or approved equal.

## **2.11 ID BADGE PRINTER**

- A. Contractor shall provide three ID Badge printers at locations shown on the Contract Drawings and two spares (total of five ID Badge Printers) with the following specifications and options:
  - 1. Print Method: Dye Sublimation/Resin Thermal Transfer
  - 2. Colors: 16.7 Million/256 Shades Per Area
  - 3. Resolution: 300dpi (11.8 dots/mm)
  - 4. Print Speed: 34 Seconds, Color with Lamination.
  - 5. Options:
    - a. Printer Cleaning Kit – One for each printer provided
    - b. HID iClass Smart Card Encoding Module
    - c. Dual Sided Printing
    - d. Ethernet with Internal Print Server
    - e. Card Lamination Module – Dual sided with Custom Hologram, Contractor to coordinate and develop hologram with the Department
- B. Contractor shall provide all required supplies, including ribbons and lamination, for the production of 20,000 dual sided ID badges.
- C. Acceptable Manufacturer/Model: Fargo Model DTC550, or approved equal.

## **2.12 ID BADGE PRODUCTION KIT**

- A. Contractor shall provide three complete ID Badge Production kits with the following accessories:
  - 1. Blue Backdrop
  - 2. Lighting Kit
  - 3. Logitech QuickCam Orbit MP 1.3 Digital USB Camera, or approved equal.

## **2.13 ACS REPORT PRINTER**

- A. Contractor shall provide two ACS report printers for installation within the ID Badge Trailer and the Security Director's office with two 2000 page toner cartridges of each color for each printer.

- B. Acceptable Manufacturer/Model: Dell Model 1320c Color Laser Printer, or Dell approved equal.

#### **2.14 13.56 MHZ CONTACTLESS SMART CARD**

- A. Provide 20,000 HID iClass® 13.56 MHz 2 Kbyte contactless smart cards, P/N 2002 pre-encoded with HID Corporate 1000 site code and badge number. Coordinate card numbers and ordering of cards with the Department.

#### **2.15 13.56MHZ CONTACTLESS SMART CARD READER**

- A. HID Corporation Model R10, no substitutions
- B. HID Corporation Model R40, no substitutions.
- C. HID Corporation Model RK40, no substitutions.

#### **2.16 BIOMETRICS FINGERPRINT READER**

- A. Provide Biometrics Fingerprint readers with integrated HID iClass smart card technology at locations detailed on the Contract Drawings and three additional desktop enrollment readers with the following characteristics:
  - 1. Humidity: 0-95%
  - 2. Power: 12 VDC
  - 3. Communications: Weigand (Field), RS-232/485 (Enrollment)
  - 4. Biometrics: Fingerprint
  - 5. Smart Card: HID iClass Corporate 1000
- B. Biometric data shall be downloaded from the SMS onto the Departments HID Corporate 1000 2 KByte contactless iClass smart card from the SMS. Upon presentation of the smart card to the reader the biometrics fingerprint and card number data from the card shall be read by the reader and the fingerprint scan reader shall enabled. After successful scan of the fingerprint the biometrics data shall be locally compared and if it is a match the card number information sent via a Weigand signal to the access control panel. If the individual has the access rights to the portal, access shall be granted.
- C. Match the AMAG authorization code for the iClass biometrics encoding the iClass Corporate 1000 facility code to ensure seamless card usage.
- D. Acceptable Manufacturer/Model: Bioscrypt Model V-Smart, or approved equal.

#### **2.17 IDENTIFICATION SCANNER**

- A. For ease of data input into the SMS for ID badging provide an Identification Scanner. This is to include the physical scanner and all required software and licenses for a physically complete and fully functional system as specified herein and detailed on the Contract Drawings.

- B. Provide three complete systems at the ID Badge Workstation at locations detailed on the Contract Drawings with the following minimum characteristics:
  - 1. Identification Documents: Driver Licenses and United States of America Passport
  - 2. Image Files: BMP, JPG, PCX, PNG, TIFF, TGA and PSD
- C. Acceptable Manufacturer/Model: Card Scanning Solution Company, Model Scanshell 1000N with idScan software, or approved equal.

## 2.18 FIBER OPTIC INTERCOM TRANSCEIVER

- A. For connection between intercom central exchange and intercom field and master stations. These units shall provide bi-directional transmission of audio for field and master stations as well as data for master stations over two multimode optical fibers. No in-field electrical or optical adjustments or in-line attenuators shall be required. All units shall be available in both rack mount and surface mount versions. All rack mount units shall have an internal D.C. power supply. A short circuit in one unit shall not affect operation of other units powered from the common power supply. The rack mount units shall be hot swappable with no risk of damage to other units or rack during replacement. The unit shall be UL listed. Operating temperature shall be 0°C to +50°C for all units.
- B. Specifications:
  - 1. Audio : One channel bi-directional
  - 2. Data: Two channels, configurable for RS-422 or RS-232
- C. Optical Specifications:
  - 1. Optical Fiber: 50/125 micron multimode
  - 2. Number of Fibers Required: 2
  - 3. Optical Wavelength: 850 nm
  - 4. Optical Emitter Type: LED
- D. The intercom transceiver shall be Zenitel model 92860M for exchange end and model 92860F for station end, no substitutions. Field station transceivers shall be either surface mount or rack mount. Refer to Contract Drawings for mounting type.

## 2.19 INTERCOM

- A. Product: Interior field stations shall be Zenitel Model 62911 Intercom, without call button, no substitutions.
- B. To be located at interior ACS delayed egress portals.
  - 1. Field station shall incorporate the following:
    - a. **NO** call button.
    - b. Integral loudspeaker.
    - c. Internal volume adjustment.

## 2.20 HORN/STROBE DEVICE

- A. Provide a horn/strobe device at each access controlled portal.
  - 1. Devices shall activate upon door alarm condition creating an audio and visual indication.
  - 2. Devices shall be silenced remotely via the ACS or upon return of the portal to a secure state.
  - 3. Upon acknowledgement of the alarm by the ACS operator the device shall reset.
- B. Horn/strobe indicator shall be a low profile strobe and shall be supplied with all mounting hardware and NO Text.
  - 1. Horn/strobes located outdoors or in environmentally uncontrolled areas shall be weather resistant.
  - 2. Strobe shall not require tools for strobe tube replacement.
  - 3. Contractor shall determine correct type of mount and back box for horn/strobe device location.
  - 4. Horn/strobe color shall be white.
- C. Acceptable manufacturer/model: Cooper Wheelock Model MT-121575, no substitutions.

## 2.21 UNINTERRUPTIBLE POWER SUPPLY

- A. Product Model: APC Smart-UPS XL Series, no substitutions.
- B. Uninterruptible power supplies (UPSs) shall be provided for all access control workstations and ID Badge printers (Tower Configuration) and for specific telecom rooms (Rack Mount) as detailed on the Contract Drawings.
- C. The UPS shall have the following operating and rating characteristics:
  - 1. Input:
    - a. Input Frequency: 60Hz
    - b. Input Connection: Receptacle, NEMA 5-15P.
  - 2. Battery: Internal battery system as required for backup runtimes.
  - 3. Communications and Management:
    - a. Interface Port: DB-9, RS-232, RJ-45, 10/100 Base-T, USB
    - b. Audible alarm: Yes
    - c. UPS Network Management – Provide card for network management of UPS via existing APC software and servers. Provide all required network cabling and connections for monitoring of UPSs provided under this project.
  - 4. Environmental:
    - a. Operating Environment: 32 - 104° Fahrenheit
    - b. Operating Relative Humidity - 0 - 95%

5. Mounting:
  - a. Telecom Room: Rack mount
  - b. Workstations: Tower Configuration
  - c. ID Badge Printer: Tower Configuration
6. Size UPSs based on the Contractor's final system design. Include an additional 25% for future power output expansion and a backup run time of a half an hour at maximum load.

## **2.22 DBC INTERFACE TERMINATION BOX (ITB)**

- A. Provide DBC Interface Termination Boxes (ITB) at security portals as shown on the Contract Drawings to facilitate interface between electrical security door hardware devices and ACS equipment. Enclosure shall have the following characteristics:
  1. NEMA Type 12 hinged cover enclosure.
  2. Construction: NEMA 250, Type 12, steel.
  3. Finish: ANSI 61 gray polyester powder coating outside, white enamel inside, over phosphatized surface.
  4. Covers: Furnish with drawing/data pocket.
  5. Cover Hardware: Provide key-locking handle. Key all enclosures alike.
  6. Size: 18 inches high by 12 inches wide by 6 inches deep, unless otherwise approved.
  7. Enclosure shall have an internal tamper switch. Tamper switch shall be plunger type with normally open dry contact switch with screw terminals for wire connection. Contacts shall be silver-plated. Tamper switch shall have the ability to be disabled while working on the electronics within the enclosure.
  8. Provide terminal strips on the back panels of each enclosure for interface to required devices and equipment. Number of terminal strips and configuration as detailed on the Contract Drawings. Provide with the following characteristics:
    - a. Conductor Size: 22 to 10 AWG
    - b. Color: Coordinate color(s) with the Department
    - c. Labeling: Coordinate labeling convention with the Department
    - d. Accessories: Provide all including end sections, circuit separators, jumper bars (all types), connector plates, shielding connectors, protection labels, and markers.
    - e. Installation: Provide pre-manufactured jumpers. Use of wire jumpers shall not be permitted.
    - f. Acceptable manufacturer: Entrelec Series M 4/6, no substitutions
  9. Terminate all cabling from the specified devices onto the terminal strips utilizing properly sized spade type connectors.
  10. Label all equipment termination enclosures with a white core laminated phenolic plastic label with white lettering on black background. Labels shall



be permanently affixed to the enclosure. Coordinate and submit labeling information to the Department for approval.

- B. Connect all devices and equipment as specified herein and detailed on the Contract Drawings to the terminal strips that are required for interface with the ACS as detailed within the Contract Drawings. Hardware interfaces shall include but are not limited to:
1. Door Position Switch (Single Door)
  2. Door Position Switch (Double Door)
  3. Bond Sensor (Single Door)
  4. Bond Sensor (Double Door)
  5. Request-to-Exit (RX) Switch – Normal Operation (Single Door)
  6. Request-to-Exit (RX) Switch – Normal Operation (Double Door)
  7. Request-to-Exit (RX) Switch – Emergency Operation (Single Door)
  8. Request-to-Exit (RX) Switch – Emergency Operation (Double Door)
  9. AC Power Fail – Field Device Power Supply
  10. Horn/Strobe Power
  11. Low Battery – Field Device Power Supply
  12. ITB Tamper Switch
  13. Field Device Power Supply Tamper Switch
  14. Lock Power (Single Door)
  15. Lock Power (Double Door)
  16. Field Device Power Supply
  17. DE5101/Chexit Delayed Egress Pre-Alarm (Single Door)
  18. DE5101/Chexit Delayed Egress Pre-Alarm (Double Door)
  19. DE5101/Chexit – Access Control Inhibit
  20. DE5101/Chexit – Fire Alarm Relay
  21. DE5101/Chexit Power
  22. DE5101/Chexit DPS – Standalone Operations
  23. DE5101 Unused/Chexit Communications

## **2.23 ELECTRICAL DOOR HARDWARE**

A. Electromagnetic Lock:

1. Locks shall meet the requirements of ANSI A156.23.
2. Surface mounted, UL listed, dual voltage electromagnetic lock with the following characteristics:
  - a. Holding Force: 1,200 pounds
  - b. Magnetic Bond sensor
  - c. Door Position Sensor
  - d. Lock Cover Tamper Switch
  - e. Time Delay Module
  - f. Power: 12/24 VDC
3. Provide with required filler plates, angle brackets, adapter brackets, and other mounting accessories.

4. Acceptable manufacturer/model: Locknetics Narrow Line Series 350, or approved equal.

B. Electric Strike:

1. Electric strike shall have the following characteristics:
  - a. Power: 12/24 VDC
  - b. Operation: > 1,000,000 Cycles
  - c. Configuration: Fail Secure
  - d. Option: Dual Switch Status Monitoring
2. Acceptable Manufacturer: Von Duprin Model 6000 series, or approved equal.

C. Door Position Switch (DPS):

1. The DPS shall interface and be compatible with access controller.
2. The DPS shall detect a ½-inch or less of separating relative movement between the magnet and the switch housing.
  - a. Upon detecting such movement, it shall transmit a signal to the access controller.
3. The DPS shall consist of a switch assembly and an actuating magnetic assembly.
  - a. The magnet assembly shall house the actuating magnet.
  - b. The switch mechanism shall comprise three independent form-C triple-biased reed contacts wired in single pull double throw (SPDT) configuration.
  - c. Switches shall be rated for a minimum lifetime of 10,000,000 operations.
  - d. Housing (except concealed) shall have three feet of stainless steel armored cable to protect leads.
4. Spacers, as required for installation, shall be of nonferrous material.
5. Exposed fasteners shall be tamper resistant.
6. Contractor shall fabricate mounts, adapters, etc., to fit existing conditions if off the shelf manufactured products are not available.
7. Acceptable Manufacturer/Model: Sentrol Model 2707A, or approved equal.

D. Delayed Egress System:

1. At locations shown on the Contract Drawings retrofit existing delayed egress Von Duprin Chexit access controlled doors with the following hardware configuration:
  - a. Electromagnetic Lock: Locknetics Narrow Line Series 350, no substitutions
  - b. Power Supply: Von Duprin Model PS873BK-FA with one hour battery back-up, no substitutions
  - c. Delayed Egress Unit: Von Duprin DE5101, no substitutions
  - d. Panic Bar: Von Duprin RX99, or approved equal

- e. Electric Power Transfer: Reuse existing power transfer (door loop or EPT).

## **2.24 POWER SUPPLY – ELECTRICAL DOOR HARDWARE**

- A. Provide power supplies as specified herein at locations as detailed on the Contract Drawings. For each portal location a separate power supply shall be provided and sized to support all required power. These power supplies shall supply power to doors, gate operator motors or other uses and shall be separate from the access controller power supply.
- B. Power supplies shall be equipped with integral battery back-up system capable of delivering normal operating power for a period of one hour under normal traffic.
- C. All required trickle-charging circuits shall be included in the scope.
- D. Failure of the battery set, charging system, or transitional switching equipment shall be recorded as an "AC Power Fail" condition on the ACS.
- E. Power supply shall provide a "low battery" signal to the ACS to alert maintenance of the battery condition to allow for replacement or repair prior to battery failure.
- F. Power supplies shall be equipped with tamper switches mounted in the cover of the device. Activation shall occur within 1/4" abnormal movement, and recorded as an "Alarm" on the ACS system. Tamper switch shall have the ability to be disabled while working on the electronics within the enclosure.
- G. Power supplies shall be individually fused and configured with 25 percent spare capacity.
- H. Acceptable Manufacturer/Model: Altronix AL1012ULX Series, no substitutions.

## **2.25 CABLE, WIRE AND LABELS**

- A. General: Provide all wire and cable as recommended by the manufacturer and in accordance with Section 16120. Wire and cable components shall be able to withstand the environment the wire or cable is installed in for a minimum of 20 years. Plenum or riser cables shall be ANSI-C2 CL2P certified.
- B. Labels: Acceptable Manufacturer/Series: Brady PermaSleeve, or approved equal.

## **2.26 SPECIAL EQUIPMENT**

- A. Special hardware, software, tools, test equipment, programming or initialization equipment needed to modify or maintain any part of the ACS or its components shall be provided as part of the ACS.

## **PART 3 - EXECUTION**

### **3.1 SITE INSPECTION**

- A. Contractor shall not begin work on site or submit shop drawings, product data, design data, or other technical submittals until after making a detailed inspection of the existing site.
1. Contractor shall verify:
    - a. Information presented in the Contract Drawings is correct.
    - b. Installation of equipment and work can be accomplished as indicated in the Contract Documents.
    - c. Contractor's proposed equipment and methods of installation are compatible with existing conditions.
  2. Take field measurements and record other data required for preparation of shop drawings and other submittals.
  3. Variations: Contract Drawings and other Documents indicate basic location, arrangement, and routing of equipment and components.
    - a. The Contractor is solely responsible for determining suitability of the existing conditions, and shall not rely on assurances of any other party in generating its assessments of site conditions. Failure to test and document installation conditions shall not be cause for any claim on behalf of the Contractor.
    - b. Where prior installations may require demolition or excavation, Contractor shall coordinate all such requests with the Department and await written permission to conduct these activities. Contractor shall bear all costs associated with such activities, including compensation to other parties for damages.
  4. Improvements and modifications of layout to accommodate Contractor's proposed equipment, field conditions, and detailed designs will be considered by the Department.
  5. Do not proceed on incorporation of modifications and associated work until receiving written approval from the Department.
  6. Reporting: Within 60 days following Notice of Award, submit a report to the Department describing the site investigation.
    - a. Indicate noted conflicts between Contract Documents and site investigation information.
    - b. Describe proposed modifications and reasons for change.
    - c. Include specification sheets and written functional requirements to support findings.
    - d. Prepare drawings and other data required showing variations and conditions requiring changes.
    - e. If work schedule is affected by site investigation, revise initial progress schedule, and submit to the Department.

7. Certify that site investigation has been performed and that, except for items noted, conditions shown and described in Contract Documents are acceptable, and equipment can be installed and work can be performed as specified without conflicts with existing site conditions.

### 3.2 INSTALLATION

- A. General: Install all system components and appurtenances in accordance with the manufacturer's instructions, applicable Codes and as shown, and furnish all necessary interconnections, services, and adjustments required for a complete and operable system as specified and shown. Control signal, communications, and data transmission line grounding shall be installed as necessary to preclude ground loops, noise, and surges from adversely affecting system operation.
- B. All wiring, including low voltage wiring outside boxes and enclosures, which is not installed in a raceway or duct bank, shall be installed in EMT (electric metallic tubing) conforming to UL 797 or IMC/RMC (intermediate metallic conduit/rigid metal conduit) in areas susceptible to damage as required by DIVISION 16 - ELECTRICAL. Minimum conduit size shall be 3/4-inch unless otherwise shown. All electrical work shall be as specified in DIVISION 16 - ELECTRICAL and as shown. Grounding shall be installed as required by Code or as necessary to preclude ground loops, noise, and surges from adversely affecting system operation.
- C. Maintain consistent color-coding and labeling for all wiring/cabling in accordance with the approved shop drawings. All wiring/cabling shall be labeled where terminated in cabinets, racks, enclosures, etc. Cables shall be labeled at each end and in intermediate junction boxes to allow for cable identification. All cable labeling in the field shall be detailed on the Contractor's as-built drawings. As-built drawings shall be updated as specified in Section 01700 to allow for concurrent inspection of the field labeling as installation progresses.
- D. Power line surge protection: All equipment connected to alternating current circuits shall be protected from power line surges.
- E. Device wiring and communication circuit surge protection: Copper wire inputs and outputs shall be protected against surges induced on communication and device wiring.
- F. Installation of signal, communications, and control conductors shall adhere to the following:
  1. Cables shall be dressed and tie wrapped in cabinets (except DBC Enclosures, see below) and/or at control panels and consoles to present a neat and orderly installation. At the discretion of the Contractor, Panduit wire duct may be installed in equipment cabinets and control consoles to facilitate satisfying this requirement.

2. Cables shall be secured to equipment cabinet backboards, console members or to other system components using cable clamps and wraps. Furnish and install cable support posts if required to facilitate system installation.
3. Cables within the DBC enclosures shall be installed within Panduit wire duct. Use of tie wraps shall not be acceptable. Submit a panel layout and enclosure mock-up to the Department for approval prior to the installation of the first DBC.
4. All cables and/or conductors shall be terminated with approved cable termination connectors compatible with the specific termination.

G. Mounting screws:

1. Mounting screws for all junction boxes, including pull boxes, and mounting of all devices shall be stainless steel type pinned Torx tamper proof screws. Size and thread type as required by manufacturer and back box type. Submit sample to Department for approval.
2. Provide a quantity of 10 tamper resistant tools of each type required for installation of the project.

### 3.3 PROGRAMMING

- A. Provide all required application programming and configuration of the SMS. Programming shall include defining hardware, portals, monitor points, clearance codes, time codes, door groups, alarm groups, operating sequences, camera alarm call-ups, and interfaces with the existing security subsystems for a complete and functional system as specified herein and detailed on the Contract Drawings. Input of ALL program data shall be by the Contractor. Coordinate with the Engineer and the Department to determine the programming requirements. These requirements shall be detailed within the Contractor's Design Manual submittal specified in Part 1.6.J of this specification.
- B. Develop and input GUI graphical maps and screens. The Department shall provide site and floor plan drawings in AutoCAD DWG format as the basis for the creation of these maps. Development of maps shall include the editing of the AutoCAD files to delete superfluous data, creation of icons for all portals, monitor points, and tamper circuits.
- C. Under supervision of the Department and utilizing hardcopy printouts of the Airport's existing cardholder database manually input the cardholder information into the database of the new ACS. Upon completion of the duplication of the database of the new system by the Contractor the Airport shall assume the responsibility of enrolling new badge holders into both the new and existing systems. Cardholder database input shall be performed on site by individuals with a current Airport ID Badge.
- D. Maintain worksheets which fully document the system program and configuration. Worksheets shall be kept up to date on a daily basis until final acceptance by the Department. Worksheets shall be subject to inspection and approval by the Department. Provide final copies to the Department prior to project close-out.

- E. Provide all software, software licenses and programming for a complete and fully operational ACS, including but not limited to, all system interfaces, programming, and monitor and control device programming.
- F. Provide 100 hours of field programming in the bid for custom programming of the system as required by the Department. Coordinate specific requirements with the Department. Include cost in Bid Form as a separate line item (refer to Bid Form 00310) at a stated hourly rate times 100 hours. Department may at their discretion, request additional programming at the bid hourly rate stated in the Bid Form (unit priced work). Department reserves the right to reject the bid rate and to negotiate a separate rate for any additional work requested under this contract.
- G. Graphics: Create, develop, and install all graphics required to make the system operational.
  - 1. Graphics shall have sufficient level of detail for personnel to operate the system and assess alarms.
  - 2. Supply hard copy, color examples at least 8½ inches by 11 inches in size, of each type of graphic to be used for the completed ACS.
  - 3. Provide examples of the video annotation used for camera identification.
  - 4. The graphics examples shall be submitted to the Department for review and approval at least 90 days prior to the Contractor's scheduled need date.

### **3.4 SYSTEM INTERFACES**

- A. ACS interface to the CCTV system shall function as follows:
  - 1. Upon receipt of an alarm by the ACS with CCTV cameras associated with it the ACS shall send a command signal to the CCTV system headend matrix switcher defining camera numbers and the monitor numbers for which video is to be called up on to assist the operator in assessment and resolution of the ACS alarm.
  - 2. Currently ACS alarms are received by the ACS system and chronologically placed in an alarm queue based on priority. The ACS system shall send a signal to the CCTV matrix switcher to allow for the display of the top four alarms in the ACS queue. These top four video images shall be displayed via video multiplexers on the 21-inch alarm display monitors at each of the two Safety Dispatch Center monitoring locations. When an operator selects an alarm out of the queue the ACS shall send a signal to the CCTV matrix switcher which shall bring up the full screen video of the camera associated with the alarm on the 21-inch monitor. When multiple camera video is associated with an alarm all video for that alarm shall be multiplexed onto the monitor screen. Upon acknowledgement of the alarm by the operator the top four video images shall return to being displayed on the 21-inch monitor, as previously described.

B. ACS interface to the DVRS shall be as follows:

1. Upon receipt of an alarm by the ACS the ACS shall send a command signal to the DVRS. This signal shall contain the alarm time stamp to allow the DVRS to store fifteen seconds of pre-alarm and 30 seconds of post alarm video for all cameras associated with the ACS alarm.

C. ACS interface to the Intercom System shall function as follows:

1. Upon receipt of a delayed egress pre-alarm by the SMS, the SMS shall provide the operator the ability to open a bidirectional audio channel between the intercom and the alarm workstation associated intercom master station by clicking on an icon on the ACS Alarm GUI to assist in resolution and acknowledgement of the delayed egress pre-alarm. Upon acknowledgement of the alarm by the operator the SMS shall send a signal to the intercom system to disconnect the audio channel.

### 3.5 STARTUP AND COMMISSIONING

A. Startup and commissioning shall be performed in accordance with the following requirements:

B. The Contractor shall not apply power to the ACS until after:

1. ACS equipment has been set up in accordance with manufacturer's instructions.
2. A visual inspection of the ACS components has been conducted to ensure that defective equipment items have not been installed and that there are no loose connections.
3. System wiring has been tested and verified as correctly connected as indicated.
4. All system grounding and transient protection systems have been verified as properly installed and connected as indicated.
5. Power supplies to be connected to the ACS and equipment have been verified as the correct voltage, phasing, and frequency as indicated.
6. Satisfaction of the above requirements shall not relieve the Contractor of responsibility for incorrect installations, defective equipment items, or collateral damage as a result of Contractor work or equipment.

### 3.6 TESTING

A. General: Perform factory testing, site testing, and adjustment of the completed ACS in accordance with Specification 13730 and the following:

1. Provide all personnel, equipment, instrumentation, and supplies necessary to perform all testing.
2. Written notification of planned testing shall be given to the Department at a minimum 14 days prior to the test, and in no case shall notice be given until after the Contractor has received written approval of the specific test procedures.



- B. Test Procedures and Reports: Test procedures shall explain, in detail, step-by-step actions and expected results demonstrating compliance with the requirements of the Specification.
  - 1. Test reports shall be used to document results of the tests.
  - 2. Reports shall be submitted to the Department for approval within 7 days after completion of each test.
- C. Contractor's Field Testing: Calibrate and test all equipment, verify operation, place the integrated system in service, and test the integrated system.
  - 1. Submit a report to the Department for approval describing results of functional tests, diagnostics, and calibrations including written certification that the installed complete system has been calibrated, tested, and is ready to begin operation.

**END OF SECTION 13710**

# **13710 Access Control System**

## **Appendix**

### **ACS Door Schedules**

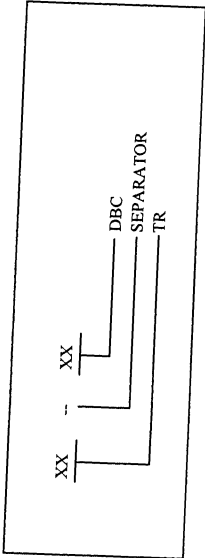
- **Version 1: Sorted by Door Number**
- **Version 2: Sorted by Existing ACC Loop**

**ACS DOOR SCHEDULE**

5:07 PM:12/13/2007

LEGEND	
TR - TELECOM ROOM	
DBC - DATABASE CONTROLLER (DOOR CONTROLLER) (NEW)	
LP - LOCAL PROCESSOR	
IDC - INTELLIGENT DEVICE CONTROLLER (DOOR CONTROLLER) (EXISTING)	
RIM - READER INTERFACE MODULE (EXISTING)	
ACC - AREA CONTROL COMPUTER (EXISTING)	
BMS - BALANCED MAGNETIC SWITCH	
NT - NORTH TERMINAL	
ST - SOUTH TERMINAL	
MT - MAIN TERMINAL	
FMF - FIELD MAINTENANCE FACILITY	
ARFF - AIR RESCUE AND FIRE FIGHTING	

**DBC IDENTIFICATION**



**GENERAL NOTES**

1. EXISTING DOOR FUNCTIONALITY SHALL BE RETAINED UNLESS OTHERWISE NOTED. CONFIRM WITH ANC SPECIAL DOOR FUNCTIONS SUCH AS EMERGENCY EXIT AND FIRE ALARM RELEASE FOR EACH DOOR PRIOR TO CUTTING DOOR OVER TO NEW ACS.
2. EXISTING IDC CONTROLLER LOCATIONS IN DOOR SCHEDULES ARE APPROXIMATE (LOCATIONS ARE TYPICALLY REFERENCED TO THE NEAREST GRID INTERSECTION). RIMS ARE LOCATED IN THE IDC ENCLOSURE OR IN SEPARATE ENCLOSURES IN THE GENERAL VICINITY OF THE IDC.
3. REUSE EXISTING IDC POWER CIRCUITS FOR NEW/DBCS UNLESS OTHERWISE NOTED.
4. REPLACE EXISTING SURFACE MOUNTED RACEWAY WITH CONCEALED CONDUIT IAW SECURITY DOOR DETAILS.

## **Version 1: Sorted by Door Number**

## North Terminal

## ACS DOOR SCHEDULE

NO.	DOOR NO.	SHEET NO.	IBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	ICRIM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	POWER CIRCUIT (N)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
1	ELEV 3	E122	T09N-03	9	0	3	8	8-3	NT	2	E & 21	E-23	STL3-11	2	N	N	N	N	N	N	
2	ELEV N2	E122	T09N-10	9	0	2	5	5-2	NT	2	E & 13	4E-8	42SPA-3	3	N	N	N	N	N	N	
3	ELEV N4	E111	T09N-02	9	0	1	4	4-1	NT	1	E & 27	8E-8	8S-39	2	N	N	N	N	N	N	LEVEL 1 LOBBY & CAB ELEV N4 IS ALSO CONNECTED TO DC 17-2
4	ELEV N4	E131	T09N-12	9	0	2	17	17-2	NT	3	E & 27	8E-15	8S-18	2	N	N	N	N	N	N	LEVEL 2 & 3 LOBBIES ELEV N4 IS ALSO CONNECTED TO DC 4-1
5	GATE N1C NC209	E122	T09N-09	9	0	3	3	3-3	NT	2	C & 15	4E-8	42SPA-3	1	Y	N	N	N	N	N	
6	GATE N2 NC208	E122	T09N-06	9	0	3	7	7-3	NT	2	E & 16	4E-8	42SPA-5	1	Y	N	N	N	N	N	
7	GATE N3 NC235	E122	T09N-01	9	0	3	2	2-3	NT	2	C & 20	E-23	STL3-11	1	Y	N	N	N	N	N	
8	GATE N4 NC275	E122	T09N-04	9	0	3	9	9-3	NT	2	E & 21	E-23	STL3-11	1	Y	N	N	N	N	N	
9	GATE N5 ND235	E121	T09N-03	9	0	2	15	15-2	NT	2	C & 29	8E-15	8S-16	1	Y	N	N	N	N	N	
10	GATE N6 ND235	E121	T09N-06	9	0	2	12	12-2	NT	2	E & 29	8E-15	SL-36	1	Y	N	N	N	N	N	
11	GATE N7 ND275	E121	T09N-01	9	0	2	14	14-2	NT	2	C & 32	8E-15	SL-15	1	Y	N	N	N	N	N	
12	GATE N8 ND285	E121	T09N-02	9	0	2	13	13-2	NT	2	E & 32	8E-15	SL-15	1	Y	N	N	N	N	N	
13	I/O LINK	E101	SE00N-01	9	0	5	14	14-5	NT	0	D & 6	3SB-7	RETAIN EXISTING	0	N	N	N	N	N	N	FIRE ALARM RESET
14	NA126 (TE01N)	E112	T01N-02	9	0	1	11	11-1	NT	1	L & 4	2S-30	RETAIN EXISTING	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM TE01N
15	NA126B (T01N)	E112	T01N-02	9	0	1	11	11-1	NT	1	L & 4	2S-30	RETAIN EXISTING	1	Y	N	N	Y	N	N	TELECOM RM T01N
16	NA132	E112	T01N-02	9	0	1	11	11-1	NT	1	L & 4	2S-30	RETAIN EXISTING	2	N	N	N	N	N	N	
17	NA162 (TE02N)	E112	T02N-01	9	0	3	12	12-3	NT	1	E & 4	3E-8	3SB-2	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM TE02N
18	NA162A (T02N)	E112	T02N-01	9	0	3	12	12-3	NT	1	E & 4	3E-8	3SB-2	1	Y	N	N	Y	N	N	TELECOM RM T02N
19	NA184	E112	T02N-01	9	0	3	13	13-3	NT	1	E & 4	3E-9	3SB-2	2	Y	N	N	N	N	Y	NOTE 11
20	NA310A	E131	T02N-05	9	0	3	5	5-3	NT	3	E & 4	4E-8	3SB-2	1	Y	N	N	N	N	N	NOTE 11
21	NA4104	E112	T01N-01	9	0	1	12	12-1	NT	1	P & 5	4E-12	20S-5	2	N	N	N	N	N	N	
22	NA4124	E112	T01N-01	9	0	1	12	12-1	NT	1	P & 5	4E-12	20S-5	2	N	N	N	N	N	N	
23	NB014 (TE00N)	E101	SE00N-01	9	0	5	17	17-5	NT	0	E & 5	3SB-7	RETAIN EXISTING	1	Y	N	N	Y	N	N	MAIN TELECOM EQUIPMENT RM TE00N
24	NB024 (SE00N)	E101	SE00N-01	9	0	5	18	18-5	NT	0	D2 & 5	3SB-5	RETAIN EXISTING	1	Y	N	N	Y	N	N	MAIN SECURITY EQUIPMENT RM SE00N
25	NB028 (T00N)	E101	SE00N-01	9	0	5	14	14-5	NT	0	D & 6	3SB-7	RETAIN EXISTING	1	Y	N	N	Y	Y	N	MAIN TELECOM RM T00N NOTE 10
26	NB105R (T03N)	E112	T03N-01	9	0	2	1	1-2	NT	1	X & 6	3SB-8	RETAIN EXISTING	1	Y	N	N	Y	N	N	TELECOM RM T03N
27	NB112	E112	T02N-02	9	0	1	15	15-1	NT	1	G & 4	4E-9	3SB-2	1	N	N	N	N	N	N	NOTE 6
28	NB113	E112	T03N-01	9	0	2	1	1-2	NT	1	X & 6	3SB-8	RETAIN EXISTING	2	N	N	N	N	N	Y	NOTES 3, 6 & 11
29	NB147/151/153	E111	T04N-08	9	0	1	10	10-1	NT	1	B & 10	8E-4	42SPA-5	2	N	Y	Y	N	Y	Y	NOTES 10 & 12
30	NB155	E111	T04N-08	-	-	-	-	-	NT	1	B & 10	N/A	42SPA-5	-	-	-	-	-	-	N	NOTE 4
31	NB164/166/172	E111	T04N-07	9	0	1	1	1-1	NT	1	E & 12	4S-19	RETAIN EXISTING	2	N	Y	Y	N	Y	Y	NOTES 10 & 12
32	NB176	E111	T04N-07	9	0	1	1	1-1	NT	1	E & 12	4S-19	RETAIN EXISTING	2	N	N	N	Y	N	Y	NOTE 11

## ACS DOOR SCHEDULE

NO.	DOOR NO.	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDC/RM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	POWER CIRCUIT (N)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
33	NB204	E122	T02N-04	9	0	2	2	2-2	NT	2	D & 5	4E-9	42SPA-1	2	N	N	N	N	N	N	
34	NB213	E122	T02N-02	9	0	2	3	3-2	NT	2	D & 7	UNKNOWN	42SPA-1	0	N	Y	N	N	Y	Y	NOTE 10
35	NB214	E122	T02N-03	9	0	2	3	3-2	NT	2	D & 7	UNKNOWN	42SPA-1	0	N	Y	N	N	Y	Y	NOTE 6 & 10
36	NB222	E122	T08N-11	9	0	2	4	4-2	NT	2	D & 6	4E-8	42SPA-1	2	N	N	N	Y	N	Y	NOTES 6 & 11
37	NB223	E122	T02N-02	9	0	2	3	3-2	NT	2	D & 7	UNKNOWN	42SPA-1	2	N	N	N	Y	N	Y	NOTE 11
38	NB225	E122	T08N-11	9	0	2	4	4-2	NT	2	D & 8	4E-8	42SPA-1	2	N	N	N	Y	N	Y	NOTES 6 & 11
39	NB227	E122	T08N-09	9	0	3	3	3-3	NT	2	C & 15	4E-8	42SPA-3	2	N	N	N	Y	N	N	
40	NB238	E122	T08N-11	9	0	2	4	4-2	NT	2	D & 8	4E-8	42SPA-1	2	N	N	N	Y	Y	Y	NOTE 10
41	NB243	E122	T08N-08	9	0	2	18	18-2	NT	2	E & 15	UNKNOWN	42SPA-3	2	N	N	N	Y	N	Y	NOTE 11
42	NB270	E122	T08N-09	9	0	3	3	3-3	NT	2	C & 15	4E-8	42SPA-3	0	N	Y	Y	N	Y	Y	NOTE 10
43	NB280	E122	T08N-06	9	0	3	7	7-3	NT	2	E & 16	4E-8	42SPA-5	0	N	Y	Y	N	Y	Y	NOTE 10
44	NB312 ROOF ACCESS	E131	T02N-05	9	0	3	5	5-3	NT	3	E & 4	4E-8	3SB-2	1	Y	N	N	N	N	N	
45	NBC 112/114/116	E111	T04N-07	-	-	-	-	-	NT	1	E & 12	N/A	4S-19	-	-	-	-	-	-	-	NOTE 2
46	NBC110	E111	T04N-07	9	0	1	1	1-1	NT	1	E & 12	4S-19	RETAIN EXISTNG	0	N	N	N	N	N	N	NOTE 1
47	NC104	E111	T04N-06	9	0	1	9	9-1	NT	1	D & 16	E-23	STL2-21	2	N	N	N	Y	N	Y	NOTE 11
48	NC115	E111	T04N-06	9	0	1	9	9-1	NT	1	D & 16	E-23	STL2-21	2	N	N	N	Y	N	Y	NOTE 11
49	NC121 (TE04N)	E111	T04N-05	9	0	1	13	13-1	NT	1	D & 17	STL2-22	RETAIN EXISTNG	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM TE04N
50	NC123 (T04N)	E111	T04N-05	9	0	1	13	13-1	NT	1	D & 17	STL2-22	RETAIN EXISTNG	1	Y	N	N	Y	N	N	TELECOM RM T04N
51	NC132 (TE05N)	E111	T04N-04	9	0	1	14	14-1	NT	1	E & 19	STL2-22	RETAIN EXISTNG	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM TE05N
52	NC132A (T05N)	E111	T04N-04	9	0	1	14	14-1	NT	1	E & 19	STL2-22	RETAIN EXISTNG	1	Y	N	N	Y	N	N	TELECOM RM T05N
53	NC137	E111	T04N-03	9	0	1	8	8-1	NT	1	B & 21	E-1	STL2-19	2	N	N	N	N	N	N	
54	NC139	E111	T04N-03	9	0	1	8	8-1	NT	1	B & 21	E-1	STL2-19	0	N	N	N	Y	N	Y	NOTE 11
55	NC146	E111	T04N-02	9	0	1	2	2-1	NT	1	E & 21	E-23	STL2-19	2	N	N	N	Y	N	Y	NOTE 11
56	NC164	E111	T04N-01	9	0	1	3	3-1	NT	1	D & 22	E-23	STL2-19	2	N	N	N	Y	N	Y	NOTE 11
57	NC200	E122	T08N-07	9	0	2	6	6-2	NT	2	E & 16	4E-8	42SPA-3	2	N	Y	Y	Y	Y	Y	NOTE 10
58	NC201	E122	T08N-05	9	0	3	4	4-3	NT	2	B & 16	4E-8	42SPA-3	2	N	N	N	Y	N	Y	NOTE 11
59	NC202	E122	T08N-07	9	0	2	6	6-2	NT	2	E & 16	4E-8	42SPA-3	2	N	Y	Y	Y	Y	Y	NOTE 10
60	NC210	E122	T08N-05	9	0	3	4	4-3	NT	2	B & 16	4E-8	42SPA-3	2	N	Y	Y	N	Y	Y	NOTE 10
61	NC220	E122	T08N-06	9	0	3	7	7-3	NT	2	E & 16	4E-8	42SPA-5	2	N	Y	Y	Y	Y	Y	NOTE 10
62	NC230	E122	T08N-01	9	0	3	2	2-3	NT	2	C & 20	E-23	STL3-11	0	N	Y	Y	N	Y	Y	NOTE 10
63	NC232	E122	T08N-03	9	0	3	9	9-3	NT	2	E & 21	E-23	STL3-11	2	N	Y	N	Y	Y	Y	NOTE 10
64	NC240	E122	T08N-04	9	0	3	9	9-3	NT	2	E & 21	E-23	STL3-11	0	N	Y	Y	N	Y	Y	NOTE 10

## ACS DOOR SCHEDULE

NO.	DOOR NO.	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDC/RM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	POWER CIRCUIT (N)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
65	NC250	E122	T08N-01	9	0	3	2	2-3	NT	2	C & 20	E-23	STL3-11	0	N	Y	Y	N	Y	Y	NOTE 10
66	NC260	E122	T08N-04	9	0	3	9	9-3	NT	2	E & 21	E-23	STL3-11	2	N	Y	Y	N	Y	Y	NOTE 10
67	NC281	E122	T08N-01	9	0	3	1	1-3	NT	2	C & 20	E-23	STL3-11	2	N	N	N	N	N	Y	NOTE 11
68	NC271	E121	T08N-01	9	0	3	1	1-3	NT	2	C & 20	E-23	STL3-11	2	N	N	N	N	N	N	
69	NC273	E122	T08N-04	9	0	3	9	9-3	NT	2	E & 21	E-23	STL3-11	2	N	Y	Y	Y	Y	Y	NOTE 10
70	NC310	E131	T08N-15	9	0	3	11	11-3	NT	3	E & 17	E-23	42SPA-7	2	N	Y	Y	N	Y	Y	NOTE 10
71	NC312B	E131	T08N-15	9	0	3	14	14-3	NT	3	E & 17	E-23	42SPA-7	1	Y	N	N	N	N	N	
72	NC313 (T08N)	E131	T08N-15	9	0	3	14	14-3	NT	3	E & 17	E-23	42SPA-7	1	Y	N	N	Y	N	N	TELECOM RM T08N
73	NC320	E131	T08N-15	9	0	3	11	11-3	NT	3	E & 17	E-23	42SPA-7	2	N	Y	Y	N	Y	Y	NOTE 10
74	NC322	E131	T08N-13	9	0	2	9	9-2	NT	3	E & 21	E-23	STL3-17	2	N	N	N	N	N	N	
75	NC326	E131	T08N-13	9	0	2	10	10-2	NT	3	E & 20	E-23	STL3-17	2	N	N	N	Y	N	Y	NOTE 11
76	NC380	E131	T08N-12	9	0	2	8	8-2	NT	3	E & 22	E-15	STL3-17	0	N	N	N	N	N	Y	NOTES 5 & 11
77	ND101	E111	T04N-01	9	0	1	3	3-1	NT	1	D & 22	E-23	STL2-19	2	N	N	N	Y	N	Y	NOTE 11
78	ND113	E111	T08N-01	9	0	1	7	7-1	NT	1	C & 28	8E-15	8S-39	2	N	N	N	Y	N	Y	NOTE 11
79	ND118 (TE06N)	E111	T06N-03	9	0	1	17	17-1	NT	1	D & 26	8S-37	RETAIN EXISTING	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM TE06N
80	ND126	E111	T06N-02	9	0	1	4	4-1	NT	1	E & 27	8E-8	8S-39	2	N	N	N	Y	N	Y	NOTE 11
81	ND128 (T08N)	E111	T06N-03	9	0	1	17	17-1	NT	1	D & 26	8S-37	RETAIN EXISTING	1	Y	N	N	Y	N	N	TELECOM RM T08N
82	ND155 (TE07N)	E111	T07N-02	9	0	1	16	16-1	NT	1	D & 31	8S-37	RETAIN EXISTING	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM TE07N
83	ND155A (T07N)	E111	T07N-02	9	0	1	16	16-1	NT	1	D & 31	8S-37	RETAIN EXISTING	1	Y	N	N	Y	N	N	TELECOM RM T07N
84	ND160	E111	T07N-03	9	0	1	5	5-1	NT	1	E & 32	8E-15	8S-37	2	N	N	N	Y	N	Y	NOTE 8 & 11
85	ND194	E111	T07N-01	9	0	1	6	6-1	NT	1	D & 33	8E-15	8S-37	2	N	N	N	Y	N	Y	NOTE 11
86	ND201	E121	T08N-04	9	0	2	16	16-2	NT	2	C & 27	UNKNOWN	8S-16	2	N	Y	N	Y	Y	Y	NOTES 10 & 12
87	ND209	E121	T08N-04	9	0	2	16	16-2	NT	2	C & 27	UNKNOWN	8S-16	2	N	Y	N	Y	Y	Y	NOTES 10 & 12
88	ND210	E121	T08N-04	9	0	2	16	16-2	NT	2	C & 27	UNKNOWN	8S-16	0	N	Y	Y	N	Y	Y	NOTE 10
89	ND220	E121	T08N-05	9	0	3	10	10-3	NT	2	E & 25	E-23	STL3-13	2	N	Y	Y	N	Y	Y	NOTE 10
90	ND230	E121	T08N-04	9	0	2	16	16-2	NT	2	C & 27	UNKNOWN	8S-16	2	N	Y	Y	N	Y	Y	NOTE 10
91	ND237	E121	T08N-03	9	0	2	15	15-2	NT	2	C & 29	8E-15	8S-16	2	N	Y	N	Y	Y	Y	NOTES 10 & 12
92	ND240	E121	T08N-06	9	0	2	11	11-2	NT	2	E & 28	8E-15	SL-36	2	N	Y	Y	N	Y	Y	NOTE 10
93	ND250	E121	T08N-03	9	0	2	15	15-2	NT	2	C & 29	8E-15	8S-16	2	N	Y	Y	N	Y	Y	NOTE 10
94	ND251	E121	T08N-08	9	0	2	12	12-2	NT	2	E & 29	8E-15	SL-36	2	N	Y	Y	Y	Y	Y	NOTE 10
95	ND253	E121	T08N-08	9	0	2	12	12-2	NT	2	E & 29	8E-15	SL-36	2	N	N	N	Y	Y	Y	NOTE 10
96	ND260	E121	T08N-06	9	0	2	12	12-2	NT	2	E & 29	8E-15	SL-36	0	N	Y	Y	N	Y	Y	NOTE 10



## ACS DOOR SCHEDULE

NO.	DOOR NO.	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDC/IRM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	POWER CIRCUIT (N)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
97	ND262	E121	T09N-02	9	0	2	13	13-2	NT	2	E & 32	8E-15	SL-15	2	N	Y	N	Y	Y	Y	NOTE 10
98	ND270	E121	T09N-01	9	0	2	14	14-2	NT	2	C & 32	8E-15	SL-15	0	N	Y	Y	N	Y	Y	NOTE 10
99	ND280	E121	T09N-02	9	0	2	13	13-2	NT	2	E & 32	8E-15	SL-15	2	N	Y	Y	N	Y	Y	NOTES 6 & 10
100	ND280	E121	T09N-02	9	0	2	13	13-2	NT	2	E & 32	8E-15	SL-15	2	N	Y	N	Y	Y	Y	NOTES 10 & 12
101	ND300	E131	T09N-12	9	0	2	8	8-2	NT	3	E & 22	E-15	STL3-17	0	N	N	N	N	N	Y	NOTES 5 & 11
102	ND314 (T09N)	E131	T09N-10	9	0	2	19	19-2	NT	3	E & 30	STL3-10	RETAIN EXISTING	1	Y	N	N	Y	N	N	TELECOM RM T09N
103	ND315 (TE09N)	E131	T09N-10	9	0	2	19	19-2	NT	3	E & 30	STL3-10	RETAIN EXISTING	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM T09N
104	ND322	E131	T09N-12	9	0	2	17	17-2	NT	3	E & 27	8E-15	8S-18	2	N	Y	N	Y	Y	Y	NOTES 7 & 10
105	ND330	E123	T09N-11	9	0	2	7	7-2	NT	3	E & 27	8E-15	8S-18	2	N	Y	Y	N	Y	Y	NOTE 10
106	ND340	E123	T09N-11	9	0	2	7	7-2	NT	3	E & 27	8E-15	8S-18	2	N	Y	Y	N	Y	Y	NOTES 6 & 10
107	ND370	E131	T09N-09	9	0	3	6	6-3	NT	3	E & 32	8E-15	SL-38	2	N	Y	Y	N	Y	Y	NOTE 10
108	ND380	E131	T09N-09	9	0	3	6	6-3	NT	3	E & 32	8E-15	SL-38	2	N	Y	Y	N	Y	Y	NOTE 10
109	NT EMPLOYEE LOT	E006	T03N-02	9	0	3	15	15-3	NT	N/A	AT GATE	3S-26	RETAIN EXISTING	1	Y	N	N	N	N	N	
110	SCREENING PANIC/DURESS	E122	T02N-02	9	0	2	3	3-2	NT	2	D & 7	UNKNOWN	42SPA-1	0	N	N	N	N	N	N	

## NOTES

1. PROVIDE CARD READER FOR ENABLE CONTROL OF OVERHEAD DOOR. REFER TO SHEET E111 AND SPECIFICATION SECTION 13710 FOR ADDITIONAL INFORMATION.
2. PROVIDE CARD READER FOR ENABLE CONTROL OF OVERHEAD DOORS. REFER TO SHEET E111 AND SPECIFICATION SECTION 13710 FOR ADDITIONAL INFORMATION.
3. CONVERT DOOR NB113 TO A DELAYED EGRESS DOOR. REFER TO SHEET E112 AND SPECIFICATION SECTION 13710 FOR ADDITIONAL INFORMATION.
4. PROVIDE ACCESS CONTROL OF DOOR NB155. REFER TO SHEET E111 AND SPECIFICATION SECTION 13710 FOR ADDITIONAL INFORMATION.
5. DOOR NOT PRESENTLY CONNECTED TO ACCESS CONTROL SYSTEM. CONFIGURE DOOR AND MAKE PROVISIONS FOR FUTURE CONNECTION TO ACCESS CONTROL SYSTEM.
6. REPLACE EXISTING SURFACE MOUNTED RACEWAY WITH CONCEALED CONDUIT IAW SECURITY DOOR DETAILS.
7. CONVERT DOOR ND322 TO A NON DELAYED EGRESS DOOR. REPLACE VON DUPRIN CHEXIT DEVICE WITH AN EMERGENCY EXIT PANIC BAR. REFER TO SPECIFICATION SECTION 13710.
8. GENERAL NOTE: REUSE EXISTING IDC POWER CIRCUITS FOR DBCs WHERE NOTED. PROVIDE NEW POWER CIRCUITS FOR DBCs WHERE NOTED. DEMOLISH EXISTING CIRCUITS WHERE NEW CIRCUITS ARE PROVIDED. FIELD VERIFY ALL EXISTING AND NEW CIRCUITS PRIOR TO CUTOVER FROM EXISTING IDC TO DBC.
9. GENERAL NOTE: REFER TO DETAILS ON SHEET E502 FOR ADDITIONAL INFORMATION ON NORTH TERMINAL DOOR CUTOVERS.
10. CONNECT EXISTING FIRE ALARM RELAY MODULE TO DOOR TO UNLOCK DOOR IAW SPECIFICATION SECTION 13710 AND DETAILS ON SHEET E502.
11. PROVIDE FIRE ALARM RELAY MODULE AND CONNECT TO DOOR TO UNLOCK DOOR IAW SPECIFICATION SECTION 13710 AND DETAILS ON SHEET E502.
12. REPLACE EXISTING VON DUPRIN "CHEXIT" DEVICE WITH VON DUPRIN DE5101 DELAYED EGRESS SYSTEM AS NOTED ON DRAWINGS (FLOOR PLANS & DETAILS ON SHEET E504) AND IN SPECIFICATION SECTION 13710.

# **South Terminal Concourses A & B and Main Terminal**

## ACS DOOR SCHEDULE

NO.	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDC/RIM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	POWER CIRCUIT (N)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
1	A SCREEN DURESS	E221	T16-08	10	1	3	13	13-3	ST-A	2	MN & M24 LEVEL 1	SPA-38	RETAIN EXISTING	N	N	N	N	N	N	N	
2	A SCREEN ENTRY (LS2A09)	E221	T16-10	10	1	5	13	13-5	ST-A	2	MO & M27 LEVEL 1	EF-14	01SPC-6 (SPH)	0	N	N	N	N	N	N	MONITOR STATUS OF OVERHEAD COLING DOOR
3	A SCREEN EXIT SA2620 (LS2A07)	E221	T16-10	10	1	5	13	13-5	ST-A	2	MO & M27 LEVEL 1	EF-14	01SPC-6 (SPH)	2	N	N	Y	Y	Y	Y	NOTE 12
4	BAG DOOR 1	E222	T20-02	--	--	--	--	--	ST-MT	2	MM 5 & M5 LEVEL 1	031SPB-5	RETAIN EXISTING	1	N	N	N	N	N	N	NOTE 1, OVERHEAD DOOR
5	BAG DOOR 2	E222	T20-06	--	--	--	--	--	ST-MT	2	MN & M10	012SPA-15	RETAIN EXISTING	1	N	N	N	N	N	N	NOTE 1, OVERHEAD DOOR
6	BAG DOOR 3	E222	T20-06	--	--	--	--	--	ST-MT	2	MN & M10	012SPA-15	RETAIN EXISTING	1	N	N	N	N	N	N	NOTE 1, OVERHEAD DOOR
7	BAG DOOR 4	E222	T20-08	--	--	--	--	--	ST-MT	2	MM 5 & M12	012SPA-17	RETAIN EXISTING	1	N	N	N	N	N	N	NOTE 1, OVERHEAD DOOR
8	ELEV 2 LEVEL 2 LOBBY	E222	T15-07	10	1	3	6	6-3	ST-MT	2	MN & M12 LEVEL 1	E-15	01SPC-13 (SPC)	1	N	N	N	N	N	N	
9	ELEV 2 CAB	E222	T15-07	10	1	3	6	6-3	ST-MT	2	MN & M12 LEVEL 1	E-15	01SPC-13 (SPC)	1	N	N	N	N	N	N	
10	S11	E212	T15-02	--	--	--	--	--	ST-MT	1	MM 5 & M12	011SPD-7	RETAIN EXISTING	1	N	N	N	N	N	N	NOTE 1, OVERHEAD DOOR
11	S1A	E211	T17-01	10	1	4	15	15-4	ST-A	1	MP & M29	UNKNOWN	101SPA-22	1	N	N	N	N	N	N	OVERHEAD DOOR
12	SA1010	E212	T21-08	--	--	--	--	--	ST-B	1	B2 & MM 5	031SPB-3	RETAIN EXISTING	1	Y	N	N	N	N	N	NOTE 1
13	SA1150	E212	T20-02	--	--	--	--	--	ST-MT	1	MM 5 & M5	031SPB-5	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
14	SA1264	E212	T15-02	--	--	--	--	--	ST-MT	1	MM 5 & M12	011SPD-7	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
15	SA1270	E212	T15-02	--	--	--	--	--	ST-MT	1	MM 5 & M12	011SPD-7	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
16	SA1282	E212	T15-01	--	--	--	--	--	ST-MT	1	MN & M12	011SPD-7	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
17	SA1340 (LS1E29) (LS1166)	E212	T15-04	10	1	3	8	8-3	ST-MT	1	MN & M14	SPA-40	RETAIN EXISTING	2	N	N	N	N	N	N	
18	SA1344	E212	T15-08	--	--	--	--	--	ST-MT	1	MN & M14	011SPD-7	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1, TELECOM EQUIPMENT RM T15
19	SA1348	E212	T15-08	--	--	--	--	--	ST-MT	1	MN & M14	011SPD-7	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1, TELECOM RM T15
20	SA1354A (LS1E53) (LS1187)	E212	T15-03	10	1	3	7	7-3	ST-MT	1	MN & M14	SPA-40	RETAIN EXISTING	1	Y	N	N	N	N	N	
21	SA1360 (LS1E29) (LS1166)	E212	T15-03	10	1	3	7	7-3	ST-MT	1	MN & M14	SPA-40	RETAIN EXISTING	2	N	Y	Y	N	Y	Y	NOTES 3 & 12
22	SA1362 (LS1E65) (LS1168)	E212	T20-11	10	1	5	7	7-5	ST-A	1	MM & M15 LEVEL 3	EO-13	01SPD-20	2	N	N	N	Y	N	Y	NOTES 6 & 13
23	SA1364 (LS1E31) (LS1165)	E212	T15-05	10	1	3	9	9-3	ST-MT	1	MN & M17	SPA-40	RETAIN EXISTING	2	N	Y	Y	N	Y	Y	NOTES 3 & 12

## ACS DOOR SCHEDULE

NO.	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDC/IRM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	POWER CIRCUIT (N)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
24	SA1368 (LS1098) (LS1153)	E212	T15-09	10	1	3	10	10-3	ST-MT	1	MM.5 & M17	SPA-40	RETAIN EXISTING	2	N	Y	Y	N	Y	Y	NOTES 3 & 12
25	SA1370 (LS1D65) (LS1136)	E212	T15-05	10	1	3	9	9-3	ST-MT	1	MN & M17	SPA-40	RETAIN EXISTING	2	N	N	N	N	N	N	
26	SA1424 (LS1D17) (LS1126)	E212	T15-09	10	1	3	10	10-3	ST-MT	1	MM.5 & M17	SPA-38	RETAIN EXISTING	2	N	N	N	N	N	N	
27	SA1430A (LS1C29) (LS1109)	E212	T15-06	10	1	3	11	11-3	ST-MT	1	MM.5 & M21	SPA-38	RETAIN EXISTING	2	N	N	N	N	N	N	
28	SA1450 (LS1C30) (LS1087)	E212	T15-06	10	1	3	11	11-3	ST-MT	1	MM.5 & M21	SPA-38	RETAIN EXISTING	2	N	Y	Y	N	Y	Y	NOTES 3 & 12
29	SA1450B (LS1C32) (LS1096)	E212	T15-10	10	1	3	12	12-3	ST-MT	1	MM.5 & M21	SPA-38	RETAIN EXISTING	2	N	Y	Y	N	Y	Y	NOTES 3 & 12
30	SA1450C (LS1B85) (LS1062)	E211	T15-10	10	1	3	12	12-3	ST-MT	1	MM.5 & M21	SPA-38	RETAIN EXISTING	2	N	Y	Y	N	Y	Y	NOTES 3 & 12
31	SA1520A (LS1B27) (LS1042)	E211	T16-08	10	1	3	13	13-3	ST-MT	1	MN & M24	SPA-38	RETAIN EXISTING	2	N	N	N	N	N	N	
32	SA1530 (LS1A17) (SA1630)	E211	T16-10	10	1	5	12	12-5	ST-A	1	MO & M27	EF-14	013SPC-6 (SPH)	2	N	N	N	N	N	N	
33	SA1550 (LS1A64)	E211	T16-09	10	1	3	14	14-3	ST-A	1	MM & M27	FX-14	013SPC-6 (SPH)	2	N	N	N	Y	N	Y	NOTE 13
34	SA1611 (SA1675)	E211	T17-02	10	1	4	6	6-4	ST-A	1	MO & M29	EG-4	101SPA-22	2	N	N	N	N	N	N	
35	SA1641 (SA1670)	E211	T17-02	10	1	4	6	6-4	ST-A	1	MO & M29	EG-4	101SPA-22	2	N	N	N	N	N	N	
36	SA1735 (SA1730)	E211	T17-03	10	1	4	8	8-4	ST-A	1	MM.5 & M30	EG-4	101SPA-20	2	N	Y	Y	Y	Y	Y	NOTES 3, 6 & 12
37	SA1737 (SA1720)	E211	T17-03	10	1	4	8	8-4	ST-A	1	MM.5 & M30	EG-4	101SPA-20	2	N	N	N	Y	N	Y	NOTES 6 & 13
38	SA1740 (SA1753)	E211	T17-03	10	1	4	7	7-4	ST-A	1	MM.5 & M30	EG-4	101SPA-20	2	N	N	N	N	N	Y	NOTE 13
39	SA1745 (SA1760)	E211	T17-04	-	-	-	-	-	ST-A	1	AU & A35	EG-14	101SPA-20	-	-	-	-	-	-	-	NOTE 4
40	SA1760 (SA1767)	E211	T17-04	10	1	4	9	9-4	ST-A	1	AU & A35	EG-14	101SPA-20	2	N	N	N	N	Y	Y	NOTES 6 & 12
41	SA1835 (SA1800)	E211 E612	T17-07	10	1	4	10	10-4	ST-A	1	AT & A38	UNKNOWN	101SPA-3	2	N	N	N	Y	N	Y	NOTES 6 & 13
42	SA1845 (SA1820)	E211	T17-06	10	1	4	11	11-4	ST-A	1	AY & A40	UNKNOWN	101SPA-3	2	N	Y	N	N	Y	Y	NOTES 3, 6 & 12
43	SA185A2 (SA1830A2) (TE17)	E211 E612	T17-07	10	1	4	13	13-4	ST-A	1	AT & A39	UNKNOWN	101SPA-3	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM TE17
44	SA185A2A (SA1830A2A) (T17)	E211 E612	T17-07	10	1	4	13	13-4	ST-A	1	AT & A39	UNKNOWN	101SPA-3	1	Y	N	N	Y	N	N	TELECOM RM T17
45	SA1910 GATE A11 (SA1846)	E211	T17-15	10	1	4	5	5-4	ST-A	1	AV & A41 LEVEL 2	EH-14	101SPA-24	2	N	N	Y	N	Y	Y	NOTES 6 & 12
46	SA1920 GATE A5 (SA1850)	E211	T17-08	10	1	5	11	11-5	ST-A	1	AV & A40	UNKNOWN	101SPA-16	2	N	N	N	Y	N	Y	NOTES 6 & 13

## ACS DOOR SCHEDULE

NO.	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DCS (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDC/RIM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	POWER CIRCUIT (N)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
47	SA1943 GATE A12 (SA1860)	E211	T17-09	10	1	4	12	12-4	ST-A	1	AX & A44	EH-14	101SPA-18	2	N	Y	Y	N	Y	Y	NOTES 3, 6 & 12
48	SA1950 (SA1900)	E211	T17-12	10	1	5	10	10-5	ST-A	1	AV & A44	EH-14	101SPA-16	2	N	N	N	Y	Y	Y	NOTES 6 & 12
49	SA1956 GATES A6 & A13 (SA1910)	E211	T17-12	10	1	5	10	10-5	ST-A	1	AV & A44	EH-14	101SPA-16	2	N	N	N	N	Y	Y	NOTES 6 & 13
50	SA1963 GATE A14 (SA1920)	E211	T17-09	10	1	4	12	12-4	ST-A	1	AX & A44	EH-14	101SPA-18	2	N	Y	Y	N	Y	Y	NOTES 3, 6 & 12
51	SA1977 GATE A15 (SA1950)	E211	T17-11	10	1	4	14	14-4	ST-A	1	AW & A48	EH-14	101SPA-18	2	N	Y	Y	N	Y	Y	NOTES 3, 6 & 12
52	SA1980 (SA1960)	E211	T17-11	10	1	5	9	9-5	ST-A	1	AW & A48	EH-14	101SPA-16	2	N	N	N	Y	N	Y	NOTES 6 & 13
53	SA1984 GATE A16 (SA1970)	E211	T17-11	10	1	5	9	9-5	ST-A	1	AW & A48	EH-14	101SPA-16	2	N	N	N	N	N	Y	NOTES 6 & 13
54	SA2050	E222	T20-03	-	-	-	-	-	ST-MT	2	MM.5 & M5 LEVEL 1	031SPB-5	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
55	SA2106	E222	T20-04	-	-	-	-	-	ST-MT	2	BL & M7 LEVEL 1	031SPB-3	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
56	SA2108	E222	T20-04	-	-	-	-	-	ST-MT	2	BL & M7 LEVEL 1	031SPB-3	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
57	SA2150	E222	T20-05	-	-	-	-	-	ST-MT	2	MM.5 & M10	012SPA-15	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
58	SA2170C	E222	T20-05	-	-	-	-	-	ST-MT	2	MM.5 & M10	012SPA-15	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
59	SA2190	E222	T20-05	-	-	-	-	-	ST-MT	2	MM.5 & M10	012SPA-15	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
60	SA2210	E222	T20-06	-	-	-	-	-	ST-MT	2	MN & M10	012SPA-15	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
61	SA2220	E222	T20-06	-	-	-	-	-	ST-MT	2	MN & M10	012SPA-15	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
62	SA2270	E222	T20-07	-	-	-	-	-	ST-MT	2	MM.5 & M12	012SPA-17	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
63	SA2300	E222	T20-07	-	-	-	-	-	ST-MT	2	MM.5 & M12	012SPA-17	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
64	SA2320	E222	T20-08	-	-	-	-	-	ST-MT	2	MM.5 & M12	012SPA-17	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
65	SA2340	E222	T16-01	-	-	-	-	-	ST-MT	2	MM.5 & M16	012SPA-17	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
66	SA2344	E222	T16-01	-	-	-	-	-	ST-MT	2	MM.5 & M16	012SPA-17	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
67	SA2352	E222	T16-02	-	-	-	-	-	ST-MT	2	MN & M20	012SPA-14	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
68	SA2380	E222	T16-02	-	-	-	-	-	ST-MT	2	MN & M20	012SPA-14	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
69	SA2392 (LS2E30) (SA2380)	E222	T20-11	10	1	5	7	7-5	ST-MT	2	MM & M15 LEVEL 3	EO-13	013SPD-20	2	N	Y	Y	N	Y	Y	NOTES 3, 6 & 12
70	SA2424	E222	T16-03	-	-	-	-	-	ST-MT	2	MM.5 & M22	012SPA-14	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
71	SA2448	E222	T16-03	-	-	-	-	-	ST-MT	2	MM.5 & M22	012SPA-14	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1

## ACS DOOR SCHEDULE

NO	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDCRIM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	POWER CIRCUIT (N)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
72	SA2450B	E221	T16-03	-	-	-	-	-	ST-B	2	MM.5 & M22	012SPA-14	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
73	SA2454	E221	T16-11	-	-	-	-	-	ST-B	2	MN & M22	012SPA-14	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
74	SA2456	E221	T16-11	-	-	-	-	-	ST-B	2	MN & M22	012SPA-14	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
75	SA2522	E221	T16-04	-	-	-	-	-	ST-B	2	MM.5 & M25	012SPA-16	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
76	SA2532	E221	T16-04	-	-	-	-	-	ST-B	2	MM.5 & M25	012SPA-16	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
77	SA2536	E221	T16-05	-	-	-	-	-	ST-B	2	MN & M25	012SPA-16	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
78	SA2566 (SA2700)	E221	T16-09	10	1	3	14	14-3	ST-A	2	MM & M27 LEVEL 1	FX-14	013SPC-6 (SPH)	2	N	Y	Y	N	Y	Y	NOTES 3 & 12
79	SA2709 (SA2760)	E221	T17-13	10	1	4	1	1-4	ST-A	2	MM & M30	EG-4	101SPA-22	2	N	Y	Y	N	Y	Y	NOTES 3 & 12
80	SA2855 (SA2870)	E221	T17-14	10	1	4	2	2-4	ST-A	2	A7 & A38	EH-14	101SPA-22	2	N	Y	Y	N	Y	Y	NOTES 3, 6 & 12
81	SA2920	E221	T17-15	10	1	4	5	5-4	ST-A	2	AV & A41	EH-14	101SPA-24	2	N	Y	Y	N	Y	Y	NOTES 3, 6 & 12
82	SA2940	E221	T17-16	10	1	4	4	4-4	ST-A	2	AV & A42	EH-14	101SPA-24	2	N	Y	Y	N	Y	Y	NOTES 3, 6 & 12
83	SA2944 GATE A6	E221	T17-16	10	1	4	19	19-4	ST-A	2	AV & A41	UNKNOWN	101SPA-24	1	Y	N	N	Y	N	N	
84	SA2955 GATE A6 (SA2960)	E221	T17-16	10	1	4	4	4-4	ST-A	2	AV & A45	EH-14	101SPA-24	1	Y	N	N	Y	N	N	
85	SA2960 (SA2940)	E221	T17-17	10	1	4	3	3-4	ST-A	2	AV & A48	EH-14	101SPA-24	2	N	Y	Y	Y	Y	Y	NOTES 3, 6 & 12
86	SA2970 GATE A7 (SA2950)	E221	T17-17	10	1	4	3	3-4	ST-A	2	AV & A48	EH-14	101SPA-24	1	Y	N	N	N	N	N	
87	SA3121 (LS3G16) (SA3020)	E231	T20-12	10	1	5	4	4-5	ST-MT	3	MM.5 & M10	EO-13	013SPD-20	2	Y	N	N	N	Y	Y	NOTES 6 & 12 KEYPAD
88	SA3123A (T20)	E231 E613	T20-10	-	-	-	-	-	ST-MT	3	MN.6 & M10	011SPD-10	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1. TELECOM RM T20
89	SA3125 (LS3G28) (SA3040)	E231	T20-12	10	1	5	4	4-5	ST-MT	3	MM.5 & M10	EO-13	013SPD-20	1	Y	N	N	N	N	N	
90	SA3127A (T20)	E231 E613	T20-10	-	-	-	-	-	ST-MT	3	MN.6 & M10	011SPD-10	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1. TELECOM EQUIPMENT RM TE20
91	SA3130 (LS3G01) (SA3110)	E231	T20-12	10	1	5	5	5-5	ST-MT	3	MM & M10	EO-13	013SPD-20	1	Y	N	N	N	N	N	
92	SA3260 (LS3E39) (SA3223)	E231	T20-11	10	1	5	6	6-5	ST-MT	3	MM & M15	EO-13	013SPD-20	2	N	Y	Y	N	Y	Y	NOTES 3, 6 & 12
93	SA3321	E231	T20-09	-	-	-	-	-	ST-MT	3	MM.5 & M13 LEVEL 2	012SPA-17	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
94	SA3455B E611	E231 E611	T16-06	-	-	-	-	-	ST-MT	3	MM.5 & M22 LEVEL 2	012SPA-14	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1. TELECOM RM T16
95	SA3475 E611	E231 E611	T16-06	-	-	-	-	-	ST-MT	3	MM.5 & M22 LEVEL 2	012SPA-14	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1. TELECOM EQUIPMENT RM TE16
96	SA3615	E231	T16-07	10	1	5	8	8-5	ST-MT	3	MM & M26	EO-13	013SPC-6 (SPH)	1	Y	N	N	N	N	N	

## ACS DOOR SCHEDULE

NO	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDCRIM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	POWER CIRCUIT (N)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
97	SA9650 (LSA345) (SA3730)	E231	T16-07	10	1	5	8	B-5	ST-MT	3	MM & M26	EO-13	013SPC-6 (SPH)	2	N	Y	Y	N	Y	Y	NOTES 3 & 12
98	SB1110	E212	T21-08	-	-	-	-	-	ST-MT	1	B2 & MM.5	031SPB-3	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 1 & 12
99	SB1230	E212	T21-07	-	-	-	-	-	ST-MT	1	B1 & BKK	031SPB-3	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
100	SB1230A	E212	T21-06	-	-	-	-	-	ST-MT	1	B4 & BK	031SPB-3	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
101	SB1805 (SB1606)	E213	T18-07	-	-	-	-	-	ST-B	1	B6 & B6	061SPD-5	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 1 & 12
102	SB1870 (SB1570)	E213	T18-01	-	-	-	-	-	ST-B	1	B4 & B'C	061SPD-5	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 1, 6 & 12
103	SB1880 (SB1740)	E213	T18-02	-	-	-	-	-	ST-B	1	B2 & B'E	061SPD-1	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
104	SB1888	E213	T18-02	-	-	-	-	-	ST-B	1	B2 & B'E	061SPD-1	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 1 & 12
105	SB1930	E213	T18-04	-	-	-	-	-	ST-B	1	B6 & B'J	061SPD-1	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
106	SB1940 (SB1766)	E213	T18-03	-	-	-	-	-	ST-B	1	B3 & B'J	061SPD-1	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
107	SB1948	E213	T18-03	-	-	-	-	-	ST-B	1	B3 & B'J	061SPD-1	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 1 & 12
108	SB1955 (SB1910A)	E213	T18-13	-	-	-	-	-	ST-B	1	B6 & B'D	061SPD-3	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
109	SB1960 (SB1790)	E213	T18-04	-	-	-	-	-	ST-B	1	B6 & B'J	061SPD-1	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
110	SB1968 (SB1660)	E213	T18-06	-	-	-	-	-	ST-B	1	B6 & B'D	061SPD-3	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
111	SB1970 (SB1870)	E213	T18-05	-	-	-	-	-	ST-B	1	B7 & B'J	061SPD-3	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
112	SB1973	E213	T18-06	-	-	-	-	-	ST-B	1	B6 & B'D	061SPD-3	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 1 & 12
113	SB1978	E213	T18-05	-	-	-	-	-	ST-B	1	B7 & B'J	061SPD-3	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 1 & 12
114	SB2130 SB2134 SB2138	E222	T20-01	-	-	-	-	-	ST-MT	2	MM & B4 LEVEL 1	031SPB-5	RETAIN EXISTING	1	N	N	N	N	N	N	NOTE 1. OVERHEAD DOORS AT MAIN TERMINAL SCREENING
115	SB2158 (SB2154)	E222	T21-05	-	-	-	-	-	ST-MT	2	BK & B1	031SPB-3	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
116	SB2338	E222	T21-04	-	-	-	-	-	ST-MT	2	BJ & B6	031SPD-19	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 1 & 12
117	SB2425	E223	T21-02	-	-	-	-	-	ST-B	2	B1 & BGG LEVEL 1	031SPD-19	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1. TELECOM EQUIPMENT RM TE21.
118	SB2425A	E223	T21-02	-	-	-	-	-	ST-B	2	B1 & BGG LEVEL 1	031SPD-19	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1. TELECOM RM T21.
119	SB2440	E223	T21-01	-	-	-	-	-	ST-B	2	BG & B4 LEVEL 1	031SPD-19	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
120	SB2445	E223	T21-02	-	-	-	-	-	ST-B	2	B1 & BGG LEVEL 1	031SPD-19	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
121	SB2525 GATE B2 (SB2140)	E223	T18-12	-	-	-	-	-	ST-B	2	B1 & BEE LEVEL 1	031SPD-17	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
122	SB2625	E223	T18-12	-	-	-	-	-	ST-B	2	B1 & BEE LEVEL 1	031SPD-17	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 1 & 12
123	SB2640 GATE B1 (SB2410)	E223	T18-11	-	-	-	-	-	ST-B	2	B4 & BCC LEVEL 1	031SPD-17	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
124	SB2660	E223	T18-11	-	-	-	-	-	ST-B	2	B4 & BCC LEVEL 1	031SPD-17	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 1 & 12
125	SB2665 GATE B4 (SB2340)	E223	T18-10	-	-	-	-	-	ST-B	2	B1 & B8B LEVEL 1	061SPD-7	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1

## ACS DOOR SCHEDULE

NO.	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDC/IRM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	POWER CIRCUIT (N)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
126	SB2730 GATE B3 (SB2420)	E223	T16-09	-	-	-	-	-	ST-B	2	B4 & BBB LEVEL 1	061SPD-5	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
127	SB2735	E223	T16-10	-	-	-	-	-	ST-B	2	B1 & BBB LEVEL 1	061SPD-7	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
128	SB2765	E223	T16-08	-	-	-	-	-	ST-B	2	B1 & BA LEVEL 1	061SPD-7	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
129	SB2785	E223	T16-08	-	-	-	-	-	ST-B	2	B1 & BA LEVEL 1	061SPD-7	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
130	SB2795	E223	T16-08	-	-	-	-	-	ST-B	2	B1 & BA LEVEL 1	061SPD-7	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
131	SB2815	E223 E612	T16-07	-	-	-	-	-	ST-B	2	B9 & B9 LEVEL 1	061SPD-5	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1, TELECOM EQUIPMENT RM T618
132	SB2817	E223 E612	T16-07	-	-	-	-	-	ST-B	2	B9 & B9 LEVEL 1	061SPD-5	RETAIN EXISTING	1	Y	N	N	Y	N	N	SEE NOTE 1, TELECOM RM T16.
133	SB2835 GATE B6 (SB2310)	E223	T16-13	-	-	-	-	-	ST-B	2	B9 & BD LEVEL 1	061SPD-3	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1



## ACS DOOR SCHEDULE

NO	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DBC DOOR CONTROLLER	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDC/IRM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	POWER CIRCUIT (N)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
134	SB2850 GATE B5 (SB2610)	E223	T18-02	-	-	-	-	-	ST-B	2	B2 & B'E LEVEL 1	061SPD-1	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
135	SB2945 GATE B8 (SB2520)	E223	T18-05	-	-	-	-	-	ST-B	2	B7 & B'J LEVEL 1	061SPD-3	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
136	SB2950 GATE B7 (SB2620)	E223	T18-03	-	-	-	-	-	ST-B	2	B3 & B'J LEVEL 1	061SPD-1	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
137	SB2985 GATE B9 (SB2530)	E223	T18-05	-	-	-	-	-	ST-B	2	B7 & B'J LEVEL 1	061SPD-3	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
138	SG121 E613	E201	T19-01	-	-	-	-	-	ST-MT	0	X & Z	N/A	SP-29	-	-	-	-	-	-	-	NOTE 5
139	TSA CS EMPLOYEE VALIDATION	E222	T20-01	-	-	-	-	-	ST-MT	2	MM & B4 LEVEL 1	031SPB-5	RETAIN EXISTING	1	N	N	N	N	N	N	NOTE 1
140	TSA CS PANIC/DURESS	E222	T20-01	-	-	-	-	-	ST-MT	2	MM & B4 LEVEL 1	031SPB-5	RETAIN EXISTING	N	N	N	N	N	N	N	NOTE 1
NOTES																					
1. CONNECT DBC TO DOOR EQUIPMENT VIA DBC INTERFACE TERMINATION BOX PROVIDED UNDER PROJECT #59016. REFER TO DETAILS ON SHEET E503 FOR ADDITIONAL INFORMATION.																					
2. NOT USED.																					
3. REPLACE EXISTING VON DUPRIN "CHEXIT" DEVICE WITH VON DUPRIN DE5101 DELAYED EGRESS SYSTEM AS NOTED ON DRAWINGS (FLOOR PLANS & DETAILS ON SHEET E504) AND IN SPECIFICATION SECTION 13710.																					
4. PROVIDE ACCESS CONTROL FOR ENABLE CONTROL OF OVERHEAD DOOR. REFER TO SHEET E211 AND SPECIFICATION SECTION 13710 FOR ADDITIONAL INFORMATION.																					
5. PROVIDE ACCESS CONTROL OF DOOR SG121. REFER TO SHEETS E201, E504 & E613 AND SPECIFICATION SECTION 13710 FOR ADDITIONAL INFORMATION.																					
6. REPLACE EXISTING SURFACE MOUNTED RACEWAY WITH CONCEALED CONDUIT IAW SECURITY DOOR DETAILS.																					
7. CONNECT TO PANIC/DURESS SWITCHES AT TSA SCREENING LOCATIONS VIA CONDUIT PROVIDED BETWEEN PANIC/DURESS SWITCH AND DBC LOCATION UNDER PROJECT No. 59016.																					
8. CONNECT TO TSA EMPLOYEE VALIDATION CARD READER VIA CONDUIT PROVIDED BETWEEN CARD READER AND DBC LOCATION UNDER PROJECT No. 59016.																					
9. CONNECT TO SCREENING ROLLUP DOOR ENABLE CARD READER VIA CONDUIT PROVIDED BETWEEN CARD READER AND DBC LOCATION UNDER PROJECT No. 59016.																					
10. GENERAL NOTE: REUSE EXISTING IDC POWER CIRCUITS FOR DBCs WHERE NOTED. PROVIDE NEW POWER CIRCUITS FOR DBCs WHERE NOTED. DEMOLISH EXISTING CIRCUITS WHERE NEW CIRCUITS ARE PROVIDED. FIELD VERIFY ALL EXISTING AND NEW CIRCUITS PRIOR TO CUTOVER FROM EXISTING IDC TO DBC.																					
11. GENERAL NOTE: REFER TO DETAILS ON SHEET E502 FOR ADDITIONAL INFORMATION ON SOUTH TERMINAL CONCOURSE A & B AND MAIN TERMINAL DOORS NOT AFFECTED BY PROJECT No. 59016.																					
12. CONNECT EXISTING FIRE ALARM RELAY MODULE TO DOOR TO UNLOCK DOOR IAW SPECIFICATION SECTION 13710 AND DETAILS ON SHEET E502 OR E504 AS APPROPRIATE.																					
13. PROVIDE FIRE ALARM RELAY MODULE AND CONNECT TO DOOR TO UNLOCK DOOR IAW SPECIFICATION SECTION 13710 AND DETAILS ON SHEETS E502 OR E504 AS APPROPRIATE.																					

## **South Terminal Concourse C**

## ACS DOOR SCHEDULE

NO.	DOOR NO. (OLD DOOR NO.)	SHEET NO.	OSC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDCRIM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
1	C0072 (C2006A)	E301	MDF-09	11	2	1	1	0-01	ST-C	0	CC2 & CH	70SPB-42	1	Y	N	N	Y	N	N	
2	C0078 (C2010A)	E301	MDF-10	11	2	1	3	0-03	ST-C	0	LEVEL 0 CH & M2	70SPF-4	1	Y	N	N	Y	N	N	
3	C0080 (C2006A)	E301 E602	MDF-07	11	2	1	18	0-18	ST-C	0	CC3 & CCF	70SPB-42	1	Y	N	N	Y	N	N	MAIN TELECOM RM T01
4	C0134 (C1001A)	E301	MDF-06	11	2	1	17	0-17	ST-C	0	CC4 & CCE	70SPB-42	1	Y	N	N	Y	N	N	
5	C0147 (C1001C)	E301	MDF-01	11	2	1	15	0-15	ST-C	0	CC5 & CCF	70SPA-1	1	Y	N	N	Y	N	Y	
6	C0163 (C1005A)	E301	MDF-05	11	2	1	16	0-16	ST-C	0	CC5 & CCE	70SPA-1	1	Y	N	N	Y	N	Y	
7	C0172 (SIN0255)	E301 E601	MDF-12	10	1	1	1	1-1	ST-C	0	CC5 & CF LEVEL 0	ATU-17	1	Y	N	N	N	N	N	
8	C0175 (C2028A)	E301	MDF-11	11	2	1	4	0-04	ST-C	0	C1 & C1	70SPD-4	1	Y	N	N	Y	N	N	
9	C0178 (C2019A)	E301	MDF-11	11	2	1	4	0-04	ST-C	0	C1 & C1	70SPD-4	1	Y	N	N	Y	N	N	
10	C0186 (C2020A)	E301	MDF-04	11	2	1	14	0-14	ST-C	0	CC6 & CG	70SPA-1	1	Y	N	N	Y	N	N	
11	C0195 (C-3001A)	E301	MDF-02	11	2	1	13	0-13	ST-C	0	C1 & CF	70SPA-1	1	Y	N	N	Y	N	N	
12	C0209 (C-4005A)	E301	N/A	11	2	1	6	0-06	ST-C	0	C1 & CG5	70SPA-3	0	N	N	N	N	N	N	DEMOLISH IDC DOOR REMOVED FROM ACS
13	C0213 (C-4007A)	E301	MDF-03	11	2	1	7	0-07	ST-C	0	C1 & CG	70SPA-3	1	Y	N	N	Y	N	N	
14	C0214 (C-4006A)	E301	MDF-03	11	2	1	7	0-07	ST-C	0	C1 & CG	70SPA-3	1	Y	N	N	Y	N	N	
15	C0449 (S6000A)	E301	T02-1	11	2	1	9	0-09	ST-C	0	CG & CF	70SPC-2	1	Y	N	N	Y	N	N	
16	C0481 (S6007A)	E301	T02-1	11	2	1	9	0-09	ST-C	0	CG & CF	70SPC-2	1	Y	N	N	Y	N	N	
17	C0511 (S6002A)	E301	T02-2	11	2	1	10	0-10	ST-C	0	CG & CF	70SPC-2	1	Y	N	N	Y	N	N	
18	C0516 (S6008A)	E301	T02-2	11	2	1	10	0-10	ST-C	0	CG & CF	70SPC-2	1	Y	N	N	Y	N	N	
19	C0516A (S6010A)	E301 E601	T02-3	11	2	1	11	0-11	ST-C	0	CG & CF	70SPC-2	1	Y	N	N	Y	N	N	TELECOM RM T02
20	C0516B (S6009A)	E301	T02-3	11	2	1	11	0-11	ST-C	0	LEVEL 0 CG & CF	70SPC-2	1	Y	N	N	Y	N	N	
21	C1038 (C1110A)	E311 E604	T03-03	11	2	2	3	1-03	ST-C	1	CC1 & CE5	71SPB-4	1	Y	N	N	Y	N	N	TELECOM RM T03
22	C1038A (C1103A)	E311 E604	T03-03	11	2	2	3	1-03	ST-C	1	CC1 & CE5	71SPB-4	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM T603
23	C1040 (C1111A)	E311	T03-02	11	2	2	2	1-02	ST-C	1	CC2 & CE5	71SPB-4	1	Y	N	N	Y	N	N	
24	C1044 (C1302A)	E311	T03-04	11	2	2	4	1-04	ST-C	1	CC1 & CCD	71SPB-4	2	N	N	N	Y	N	N	
25	C1044A (C1134A)	E311	T03-04	11	2	2	4	1-04	ST-C	1	CC1 & CCD	71SPB-4	1	Y	N	N	Y	N	N	
26	C1045 (C1135A)	E311	T03-04	11	2	2	4	1-04	ST-C	1	CC1 & CCD	71SPB-4	1	Y	N	N	Y	N	N	
27	C1051A1	E311	T03-07	11	2	2	7	1-07	ST-C	1	CC1 & CCD	71SPB-2	1	Y	N	N	Y	N	N	
28	C1051B1 (C1136A)	E311	T03-07	11	2	2	7	1-07	ST-C	1	CC1 & CCD	71SPB-2	1	N	N	N	N	N	N	
29	C1051F (C1107A)	E311	T03-06	11	2	2	6	1-06	ST-C	1	CC2 & CCC	71SPB-2	1	Y	N	N	Y	N	N	
30	C1060 (C1120A)	E311	T03-05	11	2	2	5	1-05	ST-C	1	CC1 & CCA	71SPB-2	1	Y	N	N	Y	N	N	
31	C1061 (C1121A)	E311	T03-05	11	2	2	5	1-05	ST-C	1	CC1 & CCA	71SPB-2	1	Y	N	N	Y	N	Y	
32	C1061A (C1120B)	E311	T03-05	11	2	2	5	1-05	ST-C	1	CC1 & CCA	71SPB-2	1	Y	N	N	N	N	N	
33	C1128 (C1111B)	E311	T03-10	11	2	2	10	1-10	ST-C	1	CC4 & CE5	71SPB-4	1	Y	N	N	Y	N	N	
34	C1129 (C1112A)	E311	T03-10	11	2	2	10	1-10	ST-C	1	CC4 & CE5	71SPB-4	1	Y	N	N	Y	N	N	

## ACS DOOR SCHEDULE

NO	DOOR NO. (OLD DOOR NO.)	SHEET NO.	RSC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDC/RIM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
35	C1141 (C1104A)	E311	T03-08	11	2	2	8	1-08	ST-C	1	LEVEL 1 C05 & CCB	71SPA-41	1	Y	N	N	Y	N	N	
36	C1155 (C1114C)	E311	T03-11	11	2	2	11	1-11	ST-C	1	C05 & CE5	71SPA-39	1	Y	N	N	Y	N	N	
37	C1156 (C1114A)	E311	T03-11	11	2	2	11	1-11	ST-C	1	C05 & CE5	71SPA-39	1	Y	N	N	Y	N	N	
38	C1180 (C1103A)	E311	T03-09	11	2	2	9	1-09	ST-C	1	C05 & CCB	71SPA-41	1	Y	N	N	Y	N	N	
39	C1163 (C1107E)	E311	T03-09	11	2	2	9	1-09	ST-C	1	C05 & CCB	71SPA-41	1	Y	N	N	Y	N	Y	
40	C1165 (C1123A)	E311	T03-09	11	2	2	9	1-09	ST-C	1	C05 & CCB	71SPA-41	1	Y	N	N	Y	N	N	
41	C1169 (C1107C)	E311	T03-01	11	2	2	13	1-13	ST-C	1	C05 & CB	71SPA-41	1	Y	N	N	Y	N	Y	
42	C1201 (C1044A)	E311	T07-03	11	2	2	17	1-51	ST-C	1	C1 & CF	71SPA-39	1	Y	N	N	Y	N	Y	NOTE 6
43	C1203 (C1010B)	E311	T07-03	11	2	2	17	1-51	ST-C	1	C1 & CF	71SPA-39	2	N	N	N	Y	N	N	
44	C1371 (C1040B)	E311	T07-02	11	2	2	15	1-33	ST-C	1	C7 & CF	71SPR-5	1	Y	N	N	Y	N	N	
45	C1373 (C107A)	E311	T07-02	11	2	2	15	1-33	ST-C	1	C7 & CF	71SPR-5	2	N	N	N	Y	N	N	
46	C1407 (C3ST021B)	E311	T04-01	11	2	3	1	1-34	ST-C	1	C7 & CE	71SPR-5	2	N	N	N	Y	N	N	
47	C1463A (C1044A)	E311	T04-03	11	2	3	3	1-36	ST-C	1	C9 & CB1	71SPN-5	1	Y	N	N	Y	N	N	
48	C1463C (C105A)	E311	T04-02	11	2	3	2	1-35	ST-C	1	C8 & CB	71SPN-5	1	Y	N	N	Y	N	N	
49	C1463D (C103A)	E311	T04-02	11	2	3	2	1-35	ST-C	1	C8 & CB	71SPN-5	1	Y	N	N	Y	N	N	
50	C1465 (C5ST011A)	E311	T04-03	11	2	3	3	1-36	ST-C	1	C9 & CB1	71SPN-5	2	N	N	N	Y	Y	Y	NOTE 4
51	C1504 (C6101F)	E311	T04-06	11	2	3	7	1-54A	ST-C	1	C11 & CE	71SPQ-1	0	N	N	N	Y	N	N	ROOF HATCH, BMS ONLY
52	C1507 (C5ST031A)	E311	T04-05	11	2	3	6	1-54	ST-C	1	C11 & CC4	71SPQ-1	2	N	N	N	Y	N	Y	NOTE 5
53	C1519 (C5114A)	E311	T04-04	11	2	3	4	1-37	ST-C	1	C10 & CB	71SPN-5	1	Y	N	N	Y	N	N	
54	C1528 (C6ST011B)	E311	T04-07	11	2	3	8	1-56	ST-C	1	C12 & CG9	71SPQ-3	1	Y	N	N	Y	N	Y	NOTE 6
55	C1529 (C6101E)	E311	T04-08	11	2	3	9	1-57	ST-C	1	C12 & CG9	71SPQ-3	1	Y	N	N	Y	N	Y	NOTE 6
56	C1530 (C6ST011A)	E311	T04-07	11	2	3	8	1-56	ST-C	1	C12 & CG9	71SPQ-3	2	N	N	N	Y	N	N	
57	C1532 (C6101A)	E311	T04-06	11	2	3	7	1-54A	ST-C	1	C11 & CE	71SPQ-1	2	N	N	N	Y	N	N	
58	C1533 (C3101A)	E311	T04-05	11	2	3	6	1-54	ST-C	1	C11 & CC4	71SPQ-1	2	N	N	N	Y	N	N	
59	C1533 (C6ST021B)	E311	T04-09	11	2	3	10	1-58	ST-C	1	C13 & CC4	71SPQ-1	1	Y	N	N	Y	N	Y	NOTE 6
60	C1566 (C6ST021A)	E311	T04-09	11	2	3	10	1-58	ST-C	1	C13 & CC4	71SPQ-1	1	Y	N	N	Y	N	Y	NOTE 6
61	C1569 (C3117A)	E311	T04-11	11	2	3	25	1-69	ST-C	1	C12 & CB1	71SP-2	1	Y	N	N	Y	N	N	
62	C1569A (C3106A)	E604	T04-10	11	2	3	24	1-68	ST-C	1	C12 & CB1	71SP-2	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM T604
63	C1569A1 (C5107A)	E311	T04-10	11	2	3	24	1-68	ST-C	1	C12 & CB1	71SP-2	1	Y	N	N	Y	N	N	TELECOM RM T604
64	C1603 (C7101A)	E312	T04-13	11	2	3	11	1-59	ST-C	1	C14 & CC4	71SP-2	1	Y	N	N	Y	N	N	CARD READER WITH INTEGRAL KEYPAD
65	C1631 (C7101C)	E312	T04-14	11	2	3	13	1-60	ST-C	1	C16 & CC4	81SPA-2	2	N	N	N	Y	N	Y	NOTE 5
66	C1667 (C7ST021A)	E312	T04-12	11	2	3	22	1-66	ST-C	1	C16 & CB	81SPA-2	2	N	Y	Y	Y	Y	Y	NOTE 4
67	C1679 (C7101E)	E312	T04-15	11	2	3	15	1-60B	ST-C	1	C18 & CC4	81SPA-2	2	N	N	N	Y	N	Y	CARD READER WITH INTEGRAL KEYPAD, NOTE 5
68	C1683B	E312	T05-03	11	2	3	20	1-64	ST-C	1	C19 & CB	81SPA-4	2	N	N	N	Y	N	N	CARD READER WITH INTEGRAL KEYPAD, NOTE 5

## ACS DOOR SCHEDULE

NO. DOOR NO. (OLD DOOR NO.)	SHEET NO.	SBC (DOOR CONTROLLER)	SECONDARY ACC. (E)	PRIMARY ACC. (E)	LOOP NO. (E)	IDCRIM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	CARD READERS (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
69 C1703 (C75T041A)	E312	T05-11	11	2	4	1	1-71	ST-C	1	C19 & CD	81SPA-2	1	Y	N	Y	N	Y	NOTE 6
70 C1705 (C7105A)	E312	T05-05	11	2	3	17	1-62	ST-C	1	C19 & CC-4	81SPA-2	2	N	N	Y	N	N	
71 C1710 (C7108A)	E312	T05-01	11	2	3	16	1-61	ST-C	1	C18 & CC	81SPA-4	1	Y	N	Y	N	N	
72 C1711 (C7108A)	E312	T05-01	11	2	3	16	1-61	ST-C	1	C18 & CC	81SPA-4	1	Y	N	Y	N	N	
73 C1713 (C7104A)	E312	T05-04	11	2	3	18	1-63	ST-C	1	C19 & CB-1	81SPA-4	1	Y	N	Y	N	N	
74 C1715 (C7106A)	E312	T05-03	11	2	3	20	1-64	ST-C	1	C19 & CB	81SPA-4	1	Y	N	Y	N	N	
75 C1719 (C75T031A)	E312	T05-02	11	2	3	21	1-65	ST-C	1	C18 & CB	81SPA-4	2	N	Y	Y	Y	Y	NOTE 4
76 C1728 (C8101A)	E312	T05-06	11	2	4	2	1-71A	ST-C	1	C19 & CD	81SPA-2	1	Y	N	Y	N	N	
77 C1729 (C8101B)	E312	T05-07	11	2	4	3	1-72	ST-C	1	C20 & CC-4	81SPA-6	1	Y	N	Y	N	N	
78 C1754 (C8101C)	E312	T05-08	11	2	4	4	1-72A	ST-C	1	C20 & CC-4	81SPA-6	2	N	N	Y	N	Y	NOTE 5
79 C1760 (C8110A)	E312	T05-09	11	2	4	5	1-73	ST-C	1	C22 & CD	81SPA-6	2	N	N	Y	N	N	
80 C1795 (C8104A)	E312	T05-13	11	2	4	19	1-89	ST-C	1	C22 & CB	81SPA-8	1	Y	N	Y	N	N	
81 C1801 (C8112B)	E312	T05-10	11	2	4	6	1-74	ST-C	1	C22 & CD	81SPA-6	0	N	N	N	N	N	ROOF HATCH, BMS ONLY
82 C1804 (C8112A)	E312	T05-10	11	2	4	6	1-74	ST-C	1	C22 & CD	81SPA-6	1	Y	N	Y	N	Y	
83 C1811 (C8105A)	E312 E605	T05-12	11	2	4	18	1-88	ST-C	1	C22 & CC	81SPA-8	1	Y	N	Y	N	N	TELECOM EQUIPMENT RM T05
84 C1811A (C8106A)	E312 E605	T05-12	11	2	4	18	1-88	ST-C	1	C22 & CC	81SPA-8	1	Y	N	Y	N	N	TELECOM RM T05
85 C1818 (C85T011A)	E312	T05-14	11	2	4	17	1-87	ST-C	1	C23 & CB	81SPA-8	2	N	Y	Y	Y	Y	NOTE 4
86 C1879 (C8103B)	E312	T06-01	11	2	4	8	1-76	ST-C	1	C26 & CD	81SPA-6	2	N	N	Y	N	Y	NOTE 5
87 C1919 (C8105A)	E312 E605	T06-07	11	2	4	15	1-83	ST-C	1	C27 & CB	81SP-2	1	Y	N	Y	N	N	TELECOM EQUIPMENT RM T06
88 C1919A (C8106A)	E312 E605	T06-08	11	2	4	16	1-84	ST-C	1	C23 & CB	81SPA-8	1	Y	N	Y	N	N	TELECOM RM T06
89 C1919B (C8104A)	E312	T06-08	11	2	4	16	1-84	ST-C	1	C23 & CB	81SPA-8	1	Y	N	Y	N	N	
90 C1820 (C85T011A)	E312	T06-07	11	2	4	15	1-83	ST-C	1	C27 & CB	81SP-2	2	N	Y	Y	Y	Y	NOTE 4
91 C1877 (C8102A)	E312	T06-02	11	2	4	9	1-79	ST-C	1	C30 & CD	81SPA-8	1	Y	N	Y	N	Y	NOTE 6
92 C1892 (C8107A)	E312	T06-03	11	2	4	10	1-80	ST-C	1	C30 & CC	81SP-4	2	N	N	Y	N	N	
93 C1883 (C8108A)	E312	T06-03	11	2	4	10	1-80	ST-C	1	C30 & CC	81SP-4	1	Y	N	Y	N	N	
94 C1886 (C85T031A)	E312	T06-03	11	2	4	10	1-80	ST-C	1	C30 & CC	81SP-4	2	N	Y	Y	Y	Y	NOTE 4
95 C1890 (C8108A)	E312	T06-04	11	2	4	11	1-81	ST-C	1	C30 & CB-1	81SP-4	1	Y	N	Y	N	N	
96 C1894 (C85T021A)	E312	T06-06	11	2	4	14	1-82	ST-C	1	C29 & CB	81SP-2	2	N	Y	Y	Y	Y	NOTE 4
97 C2036 (C15E01A)	E321	T07-04	12	3	1	16	2-16	ST-C	2	C05 & CF	72SPA-4	0	N	N	N	N	N	SECURITY SCREENING OHD, BMS ONLY
98 C2070 (C15E02A)	E321	T07-04	12	3	1	15	2-15	ST-C	2	C05 & CF	72SPA-4	0	N	N	N	N	N	SECURITY SCREENING OHD, BMS ONLY
99 C2153 (C1210A)	E321	T07-13	12	3	1	9	2-09	ST-C	2	C06 & CF	72SPA-2	1	Y	N	Y	N	N	
100 C2176 (C4203A)	E321	T07-05	12	3	1	1	2-01	ST-C	2	C1 & CG	72SPA-2	1	Y	N	Y	N	N	
101 C2176B (C4203B)	E321	T07-05	12	3	1	1	2-01	ST-C	2	C1 & CG	72SPA-2	0	N	N	N	N	N	ROOF HATCH, BMS ONLY
102 C2181 (C4201A)	E321	T07-13	12	3	1	9	2-09	ST-C	2	C06 & CF	72SPA-2	2	N	N	Y	N	N	

ACS DOOR SCHEDULE

NO.	DOOR NO. (OLD DOOR NO.)	SHEET NO.	RBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDC/RM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
103	C2003 (C3222A)	E321	T07-11	12	3	1	8	2-08	ST-C	2	C2 & CF	73SPA-2	1	Y	N	N	Y	N	N	
104	C2004 (C3220A)	E321 E606	T07-12	12	3	1	7	2-07	ST-C	2	C2 & CE-5	73SPA-2	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM TEO7
105	C2004A (C3221A)	E321 E606	T07-12	12	3	1	7	2-07	ST-C	2	C2 & CE-5	73SPA-2	1	Y	N	N	Y	N	N	TELECOM RM T07
106	C2004A (C3203A)	E321	T08-02	12	3	1	14	2-14	ST-C	2	C3 & CB-1	73SPA-4	1	Y	N	N	Y	N	N	
107	C2005 (C3212A)	E321	T07-14	12	3	1	6	2-06	ST-C	2	C4 & CE	73SPA-4	1	Y	N	N	Y	N	N	
108	C2653 (C351012A)	E321	T08-03	12	3	1	13	2-13	ST-C	2	C6 & CA	73SPA-1	2	N	Y	Y	Y	Y	Y	NOTE 4
109	C2695 GATE C1 (C3005A)	E321	T08-04	12	3	1	12	2-12	ST-C	2	C6 & CA	73SPA-1	1	Y	N	N	Y	N	N	
110	C2403	E321	T07-14	12	3	1	6	2-06	ST-C	2	C4 & CE	73SPA-4	2	N	N	N	Y	N	Y	NOTE 5
111	C2442 (C3211A)	E321	T04-19	12	3	1	10	2-10	ST-C	2	C9 & CB	73SPA-3	1	Y	N	N	Y	N	N	
112	C2463 (C351012A)	E321	T04-19	12	3	1	10	2-10	ST-C	2	C9 & CB	73SPA-3	2	N	Y	Y	Y	Y	Y	NOTE 4
113	C2465 GATE C2 (C3002A)	E321	T04-18	12	3	1	11	2-11	ST-C	2	C9 & CA	73SPA-3	1	Y	N	N	Y	N	N	
114	C2563 (C3007A)	E321	T04-13	12	3	2	19	2-53	ST-C	2	C12 & CB-1	73SPA-5	1	Y	N	N	Y	N	N	
115	C2592 (C751012A)	E322	T04-14	12	3	2	18	2-52	ST-C	2	C13 & CB	73SPA-5	2	N	Y	Y	Y	Y	Y	NOTE 4
116	C2594 GATE C3 (C7204A)	E322	T04-15	12	3	2	17	2-51	ST-C	2	C13 & CA	73SPA-5	1	Y	N	N	Y	N	N	
117	C2657 (C751022A)	E322	T04-16	12	3	2	15	2-49	ST-C	2	C16 & CB	83SPA-1	2	N	Y	Y	Y	Y	Y	NOTE 4
118	C2659 GATE C4 (C7202A)	E322	T04-17	12	3	2	16	2-50	ST-C	2	C16 & CA	83SPA-1	1	Y	N	N	Y	N	N	
119	C2719 (C751032A)	E322	T05-16	12	3	2	12	2-46	ST-C	2	C18 & CB	83SPA-3	2	N	Y	Y	Y	Y	Y	NOTE 4
120	C2721 GATE C5 (C7203A)	E322	T05-15	12	3	2	13	2-47	ST-C	2	C19 & CA	83SPA-3	1	Y	N	N	Y	N	N	
121	C2760 (G6206A)	E322	T05-17	12	3	2	14	2-31	ST-C	2	C20 & CC	83SPA-5	1	Y	N	N	Y	N	N	
122	C2765 (C6208A)	E322	T05-17	12	3	2	14	2-31	ST-C	2	C20 & CC	83SPA-5	1	Y	N	N	Y	N	N	
123	C2817 (C631012A)	E322	T05-18	12	3	2	11	2-45	ST-C	2	C23 & CB	83SPA-7	2	N	Y	Y	Y	Y	Y	NOTE 4
124	C2819 GATE C6 (C6211A)	E322	T05-19	12	3	2	10	2-44	ST-C	2	C23 & CA	83SPA-7	1	Y	N	N	Y	N	N	
125	C2817 (C631012A)	E322	T06-09	12	3	2	9	2-43	ST-C	2	C27 & CB	81SPP-6	2	N	Y	Y	Y	Y	Y	NOTE 4
126	C2919 GATE C7 (C6202A)	E322	T06-16	12	3	2	8	2-42	ST-C	2	C27 & CA	81SPP-6	1	Y	N	N	Y	N	N	
127	C2964 GATE C8 (C6204A)	E322	T06-14	12	3	2	1	2-36	ST-C	2	C30 & CC	81SPP-10	1	Y	N	N	Y	N	N	
128	C2966 (C631032A)	E322	T06-15	12	3	2	2	2-37	ST-C	2	C30 & CC	81SPP-10	2	N	Y	Y	Y	Y	Y	NOTE 4
129	C2968 (C6206A)	E322	T06-13	12	3	2	5	2-38	ST-C	2	C30 & CB-1	81SPP-10	1	Y	N	N	Y	N	N	
130	C2991 (C6205A)	E322	T06-12	12	3	2	4	2-39	ST-C	2	C29 & CB	81SPP-6	1	Y	N	N	Y	N	N	
131	C2994 (C631022A)	E322	T06-10	12	3	2	6	2-40	ST-C	2	C29 & CB	81SPP-6	2	N	Y	Y	Y	Y	Y	NOTE 4

ACS DOOR SCHEDULE

NO.	DOOR NO. (OLD DOOR NO.)	SHEET NO.	BOC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	IDCRIM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
132	C2966 (C5300A) (C5300A)	E322	T08-11	12	3	2	7	2-41	ST-C	C29 & CA	81SPF-8	1	Y	N	N	Y	N	N	
133	C3460 (C5300A)	E331 E607	T08-01	12	3	3	1	3-01	ST-C	C3 & CC	73SPA-2	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM TE08
134	C3460A (C5300A)	E331 E607	T08-01	12	3	3	1	3-01	ST-C	C3 & CC	73SPA-2	1	Y	N	N	Y	N	N	TELECOM RM T08
135	C3453 (C5303A)	E331	T09-02	12	3	3	14	3-14	ST-C	C8 & CA	73SPA-7	1	Y	N	N	Y	N	N	
136	C3454 (C5312A)	E331	T09-02	12	3	3	14	3-14	ST-C	C8 & CA	73SPA-7	1	Y	N	N	Y	N	N	
137	C3455 (C531013A)	E331	T09-03	12	3	3	13	3-13	ST-C	C8 & CB1	73SPA-7	2	N	Y	Y	Y	Y	Y	NOTE 4
138	C3456 (C5306A)	E331	T09-02	12	3	3	14	3-14	ST-C	C8 & CA	73SPA-7	2	N	N	N	Y	N	Y	NOTE 5
139	C3469 (C5304A)	E331	T09-01	12	3	3	2	3-02	ST-C	C9 & CC	73SPA-7	1	Y	N	N	Y	N	N	
140	C3488	E331	T09-06	12	3	3	15	3-15	ST-C	C7 & CC	73SPA-3	2	N	N	N	Y	Y	Y	NOTE 5
141	C3490	E331	T09-06	12	3	3	15	3-15	ST-C	C7 & CC	73SPA-3	2	N	N	N	Y	N	Y	NOTE 5
142	C3490A	E331	T09-06	12	3	3	15	3-15	ST-C	C7 & CC	73SPA-3	1	Y	N	N	Y	N	N	
143	C3494 (C531013B)	E331	T09-03	12	3	3	13	3-13	ST-C	C8 & CB1	73SPA-7	1	Y	N	N	Y	N	Y	NOTE 6
144	C3511	E331	T09-07	12	3	3	16	3-16	ST-C	C11 & CC	73SPA-3	2	N	N	N	Y	N	Y	NOTE 5
145	C3521	E331	T09-07	12	3	3	16	3-16	ST-C	C11 & CC	73SPA-3	2	N	N	N	Y	N	Y	NOTE 5
146	C3538	E332	T09-08	12	3	3	17	3-17	ST-C	C13 & CC	73SPB-2	2	N	N	N	Y	N	Y	NOTE 5
147	C3538	E332	T09-09	12	3	3	18	3-18	ST-C	C16 & CC	73SPB-2	1	Y	N	N	Y	N	Y	
148	C3588B	E331	T09-07	12	3	3	12	3-12	ST-C	C12 & CB1	73SPB-2	1	Y	N	N	Y	N	Y	
149	C3598C	E332	T09-08	12	3	3	17	3-17	ST-C	C13 & CC	73SPB-2	1	Y	N	N	Y	N	Y	
150	C3603 (C5308A)	E331 E607	T09-04	12	3	3	12	3-12	ST-C	C12 & CB1	73SPB-2	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM TE09
151	C3603A (C5308A)	E331 E607	T09-04	12	3	3	12	3-12	ST-C	C12 & CB1	73SPB-2	1	Y	N	N	Y	N	N	TELECOM RM T09
152	C3638	E332	T09-09	12	3	3	18	3-18	ST-C	C16 & CC	73SPB-2	2	N	N	N	Y	N	Y	NOTE 5
153	C3669 (C731023A)	E332	T09-05	12	3	3	11	3-11	ST-C	C16 & CA	73SPB-2	2	N	Y	Y	Y	Y	Y	NOTE 4
154	C3672 (C731023B)	E332	T09-05	12	3	3	11	3-11	ST-C	C16 & CA	73SPB-2	1	Y	N	N	Y	N	Y	NOTE 6
155	C3714 (C7304A)	E332	T10-01	12	3	3	3	3-03	ST-C	C18 & CB1	83SPA-11	1	Y	N	N	Y	N	N	
156	C3788 (C8305A)	E332	T10-02	12	3	3	10	3-10	ST-C	C22 & CB1	83SPA-11	1	Y	N	N	Y	N	N	
157	C3811A (C8307A)	E332 E608	T10-03	12	3	3	4	3-04	ST-C	C22 & CB1	83SPA-13	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM TE10
158	C3811A1 (C8308A)	E332 E608	T10-03	12	3	3	4	3-04	ST-C	C22 & CB1	83SPA-13	1	Y	N	N	Y	N	N	TELECOM RM T10
159	C3814	E332	T10-03	12	3	3	4	3-04	ST-C	C22 & CB1	83SPA-13	2	N	N	N	Y	N	Y	NOTE 5
160	C3817 (C8309A)	E332	T10-06	12	3	3	9	3-09	ST-C	C23 & CB1	83SPA-13	1	Y	N	N	Y	N	N	
161	C3818 (C831013A)	E332	T10-05	12	3	3	8	3-08	ST-C	C23 & CB	83SPA-13	2	N	Y	Y	Y	Y	Y	NOTE 4
162	C3820 (C831013C)	E332	T10-04	12	3	3	7	3-07	ST-C	C23 & CB	83SPA-13	1	Y	N	N	Y	N	Y	NOTE 6

## ACS DOOR SCHEDULE

NO.	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DRS (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDCRIM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	CARD READERS (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
163	C3822 (C95T0138)	E332	T10-04	12	3	3	7	3-07	ST-C	3	C23 & CB	83SPA-13	2	N	Y	Y	Y	Y	NOTE 4
164	C3900	E332	T10-06	12	3	3	6	3-06	ST-C	3	C30 & CB.1	83SPA-15	2	N	N	N	N	Y	NOTE 5
165	C3986 (C95T033A)	E332	T10-08	12	3	3	5	3-05	ST-C	3	C30 & CC	83SPA-15	2	N	Y	Y	Y	Y	NOTE 4
166	C3985 (C95T033B)	E332	T10-08	12	3	3	5	3-05	ST-C	3	C30 & CC	83SPA-15	1	Y	N	N	N	Y	NOTE 6
167	C4225 (C3402A)	E341	T11-01	12	3	4	21	4-21	ST-C	4	C1 & CB	74SPB-10	2	N	N	N	N	N	
168	C4305 (C3402B)	E341	T11-03	12	3	4	3	4-03	ST-C	4	C3 & CC	74SPB-10	2	N	N	N	N	N	
169	C4306 (C3404C)	E341	T11-04	12	3	4	4	4-04	ST-C	4	C5 & CC.4	74SPB-12	2	N	N	N	N	N	
170	C4324 (C3403A)	E341 E609	T11-05	12	3	4	20	4-20	ST-C	4	C3 & CB	74SPB-12	1	Y	N	N	N	N	TELECOM EQUIPMENT RM TE11
171	C4324A (C3405A)	E341 E609	T11-05	12	3	4	20	4-20	ST-C	4	C3 & CB	74SPB-12	1	Y	N	N	N	N	TELECOM RM T11
172	C4422 (C3404B)	E341	T11-06	12	3	4	19	4-19	ST-C	4	C8 & CA	74SPA-42	1	Y	N	N	N	Y	
173	C4426 (C5405B)	E341	T11-06	12	3	4	19	4-19	ST-C	4	C8 & CA	74SPA-42	2	N	N	N	N	N	
174	C4453 (C5405A)	E341	T12-02	12	3	4	18	4-18	ST-C	4	C9 & CB	74SPA-42	1	Y	N	N	N	Y	
175	C4457 (C55T014A)	E341	T12-02	12	3	4	18	4-18	ST-C	4	C9 & CB	74SPA-42	1	Y	N	N	N	Y	NOTE 6
176	C4481 (C55T014B)	E341	T12-02	12	3	4	18	4-18	ST-C	4	C9 & CB	74SPA-42	0	N	N	N	N	N	ROOF HATCH, BMS ONLY
177	C4664 (C5404A)	E341 E609	T12-01	12	3	4	17	4-17	ST-C	4	C12 & CB	74SPA-40	1	Y	N	N	N	N	TELECOM EQUIPMENT RM TE12
178	C4644A (C5406A)	E341 E609	T12-01	12	3	4	17	4-17	ST-C	4	C12 & CB	74SPA-40	1	Y	N	N	N	N	TELECOM RM T12
179	C4645 (C7402B)	E342	T13-01	12	3	4	16	4-16	ST-C	4	C16 & CB	84SPB-2	2	N	N	N	N	N	
180	C4670 (C75T024A)	E342	T13-01	12	3	4	16	4-16	ST-C	4	C16 & CB	84SPB-2	1	Y	N	N	N	Y	NOTE 6
181	C4672 (C75T024B)	E342	T13-01	12	3	4	16	4-16	ST-C	4	C16 & CB	84SPB-2	0	N	N	N	N	N	ROOF HATCH, BMS ONLY
182	C4697 (C7403A)	E342	T13-02	12	3	4	15	4-15	ST-C	4	C17 & CC	84SPB-2	2	N	N	N	N	N	
183	C4705 (C7405A)	E342 E610	T13-04	12	3	4	14	4-14	ST-C	4	C18 & CC	84SPB-2	1	Y	N	N	N	N	TELECOM EQUIPMENT RM TE13
184	C4705A (C7405A)	E342 E610	T13-04	12	3	4	14	4-14	ST-C	4	C18 & CC	84SPB-2	1	Y	N	N	N	N	TELECOM RM T13
185	C4707 (C7404A)	E342	T13-03	12	3	4	7	4-07	ST-C	4	C19 & CC.4	84SPB-2	1	Y	N	N	N	N	
186	C4708 (C7407B)	E342	T13-03	12	3	4	7	4-07	ST-C	4	C19 & CC.4	84SPB-2	2	N	N	N	N	N	
187	C4820 (C95T014A)	E342	T14-01	12	3	4	13	4-13	ST-C	4	C23 & CB	84SPC-2	1	Y	N	N	N	Y	NOTE 6
188	C4822 (C95T014C)	E342	T14-01	12	3	4	13	4-13	ST-C	4	C23 & CB	84SPC-2	0	N	N	N	N	N	ROOF HATCH, BMS ONLY
189	C4839 (C8403A)	E342 E610	T14-02	12	3	4	12	4-12	ST-C	4	C24 & CB.1	84SPC-2	1	Y	N	N	N	N	TELECOM EQUIPMENT RM TE14
190	C4839A (C8405A)	E342 E610	T14-02	12	3	4	12	4-12	ST-C	4	C24 & CB.1	84SPC-2	1	Y	N	N	N	N	TELECOM RM T14
191	C4844 (C95T014B)	E342	T14-01	12	3	4	13	4-13	ST-C	4	C23 & CB	84SPC-2	2	N	Y	Y	Y	Y	NOTE 4
192	C4967 (C95T034A)	E342	T14-03	12	3	4	9	4-09	ST-C	4	C30 & CC	84SPC-4	2	N	Y	Y	Y	Y	NOTE 4
193	C5965 (C95T035A)	E342	T14-04	12	3	4	10	4-10	ST-C	5	LEVEL 5 C30 & CB.1	84SPC-4	2	N	N	N	N	N	



ACS DOOR SCHEDULE

NO.	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DRC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDC/RM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
194	CL11 LEVEL 1 LOBBY (C1E002)	E311	T03-06	11	2	2	8	1-08	ST-C	1	C05 & C08	71SPA-41	1	N	N	N	N	N	N	ELEVATOR LEVEL 1 LOBBY CARD READER
195	CL11 C08 (C1E002)	E311	T03-06	11	2	2	8	1-08	ST-C	1	LEVEL 1 C05 & C08	71SPA-41	1	N	N	N	N	N	N	ELEVATOR CAB CARD READER
196	CL56 L2 (C5E01)	E311	T04-03	11	2	3	3	1-36	ST-C	1	C9 & CB.1	71SPN-5	1	N	N	N	N	N	N	ELEVATOR LEVEL 2 LOBBY CARD READER
197	CL56 L3 (C5E01)	E321	T04-03	11	2	3	3	1-36	ST-C	1	C9 & CB.1	71SPN-5	1	N	N	N	N	N	N	ELEVATOR LEVEL 3 LOBBY CARD READER
198	CL57 (C6E01 C1)	E301	T02-3	11	2	1	11	0-11	ST-C	0 AND 1	C9 & CF	70SPC-2	1	N	N	N	N	N	N	ELEVATOR CAB CARD READER
199	CL57 (C6E01 L1)	E301	T02-3	11	2	1	11	0-11	ST-C	1	LEVEL 0 C9 & CF	70SPC-2	1	N	N	N	N	N	N	ELEVATOR LEVEL 1 LOBBY CARD READER
200	CL78 B1 (C7E01)	E312	T05-04	11	2	3	19	1-63	ST-C	1	C19 & CB.1	81SPA-4	1	N	N	N	N	N	N	ELEVATOR CAB CARD READER
201	CL78 B2 (C7E01)	E312	T05-04	11	2	3	19	1-63	ST-C	1	C19 & CB.1	81SPA-4	0	N	N	N	N	N	N	
202	CL78 B3 (C7E01)	E312	T05-04	11	2	3	19	1-63	ST-C	1	C19 & CB.1	81SPA-4	0	N	N	N	N	N	N	
203	CL78 B4 (C7E01)	E312	T05-04	11	2	3	19	1-63	ST-C	1	C19 & CB.1	81SPA-4	0	N	N	N	N	N	N	
204	CL78 L2 (C7E01)	E321	T05-04	11	2	3	18	1-63	ST-C	1	C19 & CB.1	81SPA-4	1	N	N	N	N	N	N	ELEVATOR LEVEL 2 LOBBY CARD READER
205	CL78 L3 (C7E01)	E331	T05-04	11	2	3	18	1-63	ST-C	1	C19 & CB.1	81SPA-4	1	N	N	N	N	N	N	ELEVATOR LEVEL 3 LOBBY CARD READER
206	CL99 B1 (C9E01)	E312	T06-05	11	2	4	12	1-78	ST-C	1	LEVEL 1 C30 & CB.1	81SPP-4	1	N	N	N	N	N	N	ELEVATOR CAB CARD READER
207	CL99 B2 (C9E01)	E312	T06-05	11	2	4	12	1-78	ST-C	1	LEVEL 1 C30 & CB.1	81SPP-4	0	N	N	N	N	N	N	
208	CL99 B3 (C9E01)	E312	T06-05	11	2	4	12	1-78	ST-C	1	LEVEL 1 C30 & CB.1	81SPP-4	0	N	N	N	N	N	N	
209	CL99 B4 (C9E01)	E312	T06-05	11	2	4	12	1-78	ST-C	1	LEVEL 1 C30 & CB.1	81SPP-4	0	N	N	N	N	N	N	
210	CL99 L2 (C9E01)	E321	T06-05	11	2	4	13	1-78	ST-C	2	LEVEL 1 C30 & CB.1	81SPP-4	1	N	N	N	N	N	N	ELEVATOR LEVEL 2 LOBBY CARD READER
211	CL99 L3 (C9E01)	E331	T06-05	11	2	4	13	1-78	ST-C	3	LEVEL 1 C30 & CB.1	81SPP-4	1	N	N	N	N	N	N	ELEVATOR LEVEL 3 LOBBY CARD READER
212	DUMBWATER GATE C1	E321	T06-04	12	3	1	12	2-12	ST-C	2	C6 & CA	73SPA-1	1	N	N	N	N	N	N	
213	DUMBWATER GATE C2	E321	T04-16	12	3	1	11	2-11	ST-C	2	C9 & CA	73SPA-3	1	N	N	N	N	N	N	
214	DUMBWATER GATE C3	E322	T04-15	12	3	2	17	2-51	ST-C	2	C13 & CA	73SPA-5	1	N	N	N	N	N	N	
215	DUMBWATER GATE C4	E322	T04-17	12	3	2	16	2-50	ST-C	2	C16 & CA	83SPA-1	1	N	N	N	N	N	N	
216	DUMBWATER GATE C5	E322	T05-15	12	3	2	13	2-47	ST-C	2	C19 & CA	83SPA-3	1	N	N	N	N	N	N	
217	DUMBWATER GATE C6	E322	T05-19	12	3	2	10	2-44	ST-C	2	C23 & CA	83SPA-7	1	N	N	N	N	N	N	
218	DUMBWATER GATE C7	E322	T06-16	12	3	2	8	2-42	ST-C	2	C27 & CA	81SPP-6	1	N	N	N	N	N	N	
219	DUMBWATER GATE C8	E322	T06-12	12	3	2	4	2-39	ST-C	2	C29 & CB	81SPP-8	1	N	N	N	N	N	N	
220	DUMBWATER GATE C9	E322	T06-14	12	3	2	1	2-36	ST-C	2	C30 & CC	81SPP-10	1	N	N	N	N	N	N	
221	FSD/CS-01	E311	T07-01	11	2	2	14	1-31	ST-C	1 & 2	LEVEL 1 C1 & C1	71SPD-42	1	N	N	N	N	N	N	CURBSIDE CHECK-IN BAGBELT
222	OB1-01	E321	T07-06	12	3	1	2	2-02	ST-C	2	C1 & CG	72SPA-6	1	N	N	N	N	N	N	ALASKA AIRLINES OVERSIZE BAGBELT
223	OB2-02	E321	T07-06	12	3	1	2	2-02	ST-C	2	C1 & CG	72SPA-6	1	N	N	N	N	N	N	ALASKA AIRLINES SOUTH OUTBOUND BAGBELT
224	OB4-02	E321	T07-07	12	3	1	3	2-03	ST-C	2	C1 & CG	72SPA-6	1	N	N	N	N	N	N	ALASKA AIRLINES CENTER OUTBOUND BAGBELT
225	OB5-02	E321	T07-07	12	3	1	3	2-03	ST-C	2	C1 & CG	72SPA-6	1	N	N	N	N	N	N	ALASKA AIRLINES TICKET COUNTER BAGBELT
226	OB7-02	E321	T07-06	12	3	1	4	2-04	ST-C	2	C4 & CG	72SPA-6	1	N	N	N	N	N	N	ALASKA AIRLINES NORTH OUTBOUND BAGBELT

ACS DOOR SCHEDULE

NO.	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDCRIM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
227	08B-02	E321	T07-09	12	3	1	5	2-05	ST-C	2	C5 & CG	72SPA-6	1	N	N	N	N	N	N	AMERICAN AIRLINES OUTBOUND BAGGELT
228	OVERSIZE BAGGAGE	E311	T07-03	--	--	--	--	--	ST-C	1	C1 & CF	71SPA-39	1	N	N	N	N	N	N	NOTE 1 OVERSIZE BAGGAGE OHD AT ALASKA AIRLINES BAG CLAIM
229	S0617 (C2310A)	E301	MDF-06	11	2	1	2	0-02	ST-C	0	CC3 & CH	70SPB-42	2	N	N	N	N	N	N	
230	S1677 (C2127) (C15E03A)	E311	T07-01	11	2	2	14	1-31	ST-C	1	LEVEL 1 C1 & C1	71SPD-42	1	Y	N	N	Y	N	Y	NOTE 6
231	S2647 (C2204A)	E321	T07-04	12	3	1	15	2-15	ST-C	2	CC5 & CF	72SPA-4	0	N	N	N	N	N	N	SECURITY SCREENING OHD BMS ONLY.
232	S2679 (C4217A)	E321	T07-01	11	2	2	14	1-31	ST-C	2	LEVEL 1 C1 & C1	71SPD-42	1	Y	N	N	Y	N	N	
233	S2696 (C4201B)	E321	T07-05	12	3	1	1	2-01	ST-C	2	C1 & CG	72SPA-2	2	N	N	N	Y	N	Y	NOTE 5
235	S2722 (C4202A)	E321	T07-11	12	3	1	8	2-08	ST-C	2	C2 & CF	72SPA-2	1	Y	N	N	Y	N	Y	NOTE 6
236	S2722G (T0105A)	E321	T07-09	12	3	1	5	2-05	ST-C	2	C5 & CG	72SPA-6	1	Y	N	N	Y	N	Y	NOTE 6
237	S2767 (T0112A)	E321	T07-08	12	3	1	4	2-04	ST-C	2	C4 & CG	72SPA-6	1	Y	N	N	Y	N	N	
238	S2867 (C4206A)	E321	T07-06	12	3	1	5	2-05	ST-C	2	C5 & CG	72SPA-6	0	N	N	N	N	N	N	ACCESS DOOR BMS ONLY
239	TRANSFER BELT TB-01	E311	T03-08	11	2	2	8	1-08	ST-C	1	LEVEL 1 CC5 & CGB	71SPA-41	1	Y	N	N	N	N	N	

NOTES

1. PROVIDE CARD READER FOR ENABLE CONTROL OF OVERHEAD DOOR. REFER TO SHEET E311 AND SPECIFICATION SECTION 13710 FOR ADDITIONAL INFORMATION.
2. GENERAL NOTE: REUSE EXISTING IDC POWER CIRCUITS FOR DBCs.
3. GENERAL NOTE: REFER TO DETAILS ON SHEET E502 FOR ADDITIONAL INFORMATION ON SOUTH TERMINAL CONCOURSE C DOOR CUTOVERS.
4. CONNECT EXISTING FIRE ALARM RELAY MODULE TO DOOR TO UNLOCK DOOR JAW SPECIFICATION SECTION 13710 AND DETAILS ON SHEET E502
5. PROVIDE FIRE ALARM RELAY MODULE AND CONNECT TO DOOR TO UNLOCK DOOR JAW SPECIFICATION SECTION 13710 AND DETAILS ON SHEET E502
6. EXISTING EXIT DOOR EQUIPPED WITH ELECTROMAGNETIC LOCK. REPLACE ELECTROMAGNETIC LOCK WITH ELECTRIC STRIKE. DOOR DETAILS TO BE ISSUED BY ADDENDUM.

## **Field Maintenance Facility**

ACS DOOR SCHEDULE

DOOR NO. OLD DOOR NO.	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDCRIM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
1 AM EAST GATE	E005	T01F-11	9	0	5	6	6-5	FMF	1	AT GATE	LOCAL	2	N	N	N	N	N	N	
2 AM NORTH GATE	E005	T01F-12	9	0	5	12	12-5	FMF	1	AT GATE	LOCAL	2	N	N	N	N	N	N	
3 AM1000	E411	T01F-08	9	0	5	7	7-5	FMF	1	K & 28	2SA-30	1	Y	N	N	N	N	Y	NOTES 5 & 6
4 AM1004	E411	T01F-06	9	0	5	5	5-5	FMF	1	S & 28	2SA-22	2	N	Y	N	Y	Y	Y	NOTE 4
5 AM1062	E411	T01F-05	9	0	5	4	4-5	FMF	1	T & 26	2SA-22	2	N	N	N	Y	N	N	
6 AM1090	E411	T01F-05	9	0	5	4	4-5	FMF	1	T & 26	2SA-22	2	N	Y	N	Y	Y	Y	NOTE 4
7 AM1218	E411	T01F-10	9	0	5	2	2-5	FMF	1	P & 21	2SA-20	2	N	N	N	Y	N	N	
8 AM1228	E411	T01F-07	9	0	5	3	3-5	FMF	1	T & 22	2SA-20	2	N	N	N	Y	N	N	
9 AM1251	E411	T01F-09	9	0	5	11	11-5	FMF	1	E & 19	2SC-17	2	N	Y	N	Y	N	Y	NOTE 5
10 AM1258 (T01F)	E411	T01F-01	9	0	5	1	1-5	FMF	1	N & 18	2SA-20	1	Y	N	N	N	Y	N	TELECOM RM T01F. NOTE 4.
11 AM1271	E411	T01F-03	9	0	5	9	9-5	FMF	1	J & 20	2SB-9	2	N	N	N	Y	Y	Y	NOTE 4
12 AM1272	E411	T01F-01	9	0	5	1	1-5	FMF	1	N & 18	2SA-20	2	N	N	N	Y	Y	Y	NOTE 4
13 AM1273	E411	T01F-04	9	0	5	10	10-5	FMF	1	F & 18	2SB-9	2	N	N	N	Y	N	Y	NOTE 5
14 AM1275	E411	T02F-04	9	0	5	10	10-5	FMF	1	F & 18	2SB-9	2	N	Y	N	Y	Y	Y	NOTE 4
15 AM1300	E411	T01F-02	9	0	5	8	8-5	FMF	1	K & 17	2SB-9	2	N	N	N	Y	Y	Y	NOTE 4
16 AM1330A	E411	T01F-10	-	-	-	-	-	FMF	1	-	2SA-20	N	N	N	N	-	-	N	NOTE 1
17 AM1766 (T02F)	E411	T02F-01	9	0	5	20	20-5	FMF	1	W & 5	21-47	1	Y	N	N	N	Y	N	TELECOM RM T02F. NOTE 4.
18 AM37	E411	T01F-06	9	0	5	5	5-5	FMF	1	S & 28	2SA-22	1	N	N	N	N	N	N	OVERHEAD DOOR

NOTES

1. PROVIDE ACCESS CONTROL AT DOOR AM1330A. REFER TO SHEET E411 AND SPECIFICATION SECTION 13710 FOR ADDITIONAL INFORMATION.
2. GENERAL NOTE: REUSE EXISTING IDC POWER CIRCUITS FOR DBCs.
3. GENERAL NOTE: REFER TO DETAILS ON SHEET E502 FOR ADDITIONAL INFORMATION ON FMF DOOR CUTOVERS.
4. CONNECT EXISTING FIRE ALARM RELAY MODULE TO DOOR TO UNLOCK DOOR IAW SPECIFICATION SECTION 13710 AND DETAILS ON SHEET E502.
5. PROVIDE FIRE ALARM RELAY MODULE AND CONNECT TO DOOR TO UNLOCK DOOR IAW SPECIFICATION SECTION 13710 AND DETAILS ON SHEET E502.
6. EXISTING EXIT DOOR EQUIPPED WITH ELECTROMAGNETIC LOCK. REPLACE ELECTROMAGNETIC LOCK WITH ELECTRIC STRIKE. DOOR DETAILS TO BE ISSUED BY ADDENDUM.

## **Outlying Areas**

ACS DOOR SCHEDULE

NO.	DOOR/GATE NO.	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO (E)	IDCRIM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
1	ASIG GATE	E006	T00N-09	9	0	5	16	16-5	EXTERIOR	N/A	AT GATE	LOCAL	4	N	N	N	N	N	EXTERIOR GATE
2	BADGING OFFICE	E412	T01B-01	9	0	4	11	11-4	BADGING OFFICE	N/A	BADGING OFFICE	A-26	1	N	N	N	N	N	BADGING STATION VERIFICATION CARD READER
3	BADGING OFFICE	E412	T01B-01	9	0	4	12	12-4	BADGING OFFICE	N/A	BADGING OFFICE	A-26	2	N	N	N	N	N	BADGING STATION VERIFICATION CARD READER
4	FA100A	E412	T01S-01	9	0	4	8	8-4	ARFF	1	E & 8 LEVEL 2	C-6	1	Y	N	N	N	Y	NOTES 1 & 8
5	FA202	E412	T01S-01	9	0	4	10	10-4	ARFF	2	E & 7	C-6	1	Y	N	N	N	N	
6	FB100	E412	T01S-01	9	0	4	8	8-4	ARFF	1	E & 8 LEVEL 2	C-6	1	Y	N	N	N	N	
7	FB102	E412	T01S-01	9	0	4	9	9-4	ARFF	1	E & 8 LEVEL 2	C-6	1	Y	N	N	N	N	
8	FB104	E412	T01S-01	-	-	-	-	-	ARFF	1	E & 8 LEVEL 2	C-6	-	-	-	-	-	-	NOTE 4
9	FB202	E412	T01S-01	9	0	4	10	10-4	ARFF	2	E & 7	C-6	1	Y	N	N	N	N	
10	GATE E21	E005	T00N-05	10	1	1	12	12-1	EXTERIOR	N/A	AT GATE	LOCAL	1	N	N	N	N	N	EXTERIOR GATE
11	GATE N10	E005	T00N-01	9	0	4	6	6-4	EXTERIOR	N/A	GATE N10	LOCAL	1	1	N	N	N	N	
12	GATE N12	E412	T01S-02	9	0	4	4	4-4	ARFF	N/A	GATE N13	RETAIN EXISTING	2	N	N	N	N	N	EXTERIOR GATE
13	GATE N13	E412	T01S-02	9	0	4	4	4-4	ARFF	N/A	AT GATE	RETAIN EXISTING	2	N	N	N	N	N	EXTERIOR GATE
14	GATE N14	E412	T01S-03	9	0	4	14	14-4	ARFF	N/A	AT GATE	P-2	2	N	N	N	N	N	EXTERIOR GATE
15	GATE N17A/B	E006	T00N-07	-	-	-	-	-	EXTERIOR	N/A	AT GATE	LOCAL	2	N	N	N	N	N	EXTERIOR GATE NOTE 2
16	GATE N30A/B	E005	T00N-02	9	0	4	19	19-4	EXTERIOR	N/A	AT GATE	LOCAL	4	N	N	N	N	N	EXTERIOR GATE
17	GATE N41	E005	T00N-03	9	0	4	7	7-4	EXTERIOR	N/A	AT GATE	LOCAL	1	Y	N	N	N	N	EXTERIOR GATE
18	GATE N69A	E006	T00N-06	-	-	-	-	-	EXTERIOR	N/A	AT GATE	LOCAL	1	Y	N	N	N	N	EXTERIOR GATE NOTE 3
19	GATE N64	E005	T00N-04	9	0	5	15	15-5	EXTERIOR	N/A	AT GATE	LOCAL	2	N	N	N	N	N	EXTERIOR GATE
20	ST EMPLOYEE PARKING	E006	T00N-08	10	1	1	3	3-1	EXTERIOR	N/A	AT GATE	LOCAL	3	N	N	N	N	N	EXTERIOR GATE

NOTES

1. PROVIDE FIRE ALARM RELAY MODULE AND CONNECT TO DOOR TO UNLOCK DOOR JAW SPECIFICATION SECTION 13710 AND DETAILS ON SHEET E503.
2. PROVIDE ACCESS CONTROL OF EXISTING GATE N69A. REFER TO SHEET E006, E701 AND SPECIFICATION SECTION 13710 FOR ADDITIONAL INFORMATION.
3. PROVIDE ACCESS CONTROL OF EXISTING GATE N17A/B. REFER TO SHEET E006, E701 AND SPECIFICATION SECTION 13710 FOR ADDITIONAL INFORMATION.
4. PROVIDE ACCESS CONTROL OF EXISTING DOOR FB104. REFER TO SHEET E412, E504 AND SPECIFICATION SECTION 13710 FOR ADDITIONAL INFORMATION.
5. GENERAL NOTE: REUSE EXISTING IDC POWER CIRCUITS FOR DBCs.
6. GENERAL NOTE: REUSE EXISTING IDC POWER CIRCUITS FOR DBCs.
7. GENERAL NOTE: REFER TO DETAILS ON SHEETS E005 AND E006 FOR ADDITIONAL INFORMATION ON REMOTE GATE CUTOVERS.
8. EXISTING EXT DOOR EQUIPPED WITH ELECTROMAGNETIC LOCK. REPLACE ELECTROMAGNETIC LOCK WITH ELECTRIC STRIKE. DOOR DETAILS TO BE ISSUED BY ADDENDUM.

## **Version 2: Sorted by Existing ACC Loop**

## **North Terminal**



## ACS DOOR SCHEDULE

NO.	DOOR NO.	SHEET NO.	DBC (DOOR CONTROL)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDC/RM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	POWER CIRCUIT (N)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
1	NB176	E111	T04N-07	9	0	1	1	1-1	NT	1	E & 12	4S-19	RETAIN EXISTNG	2	N	N	N	Y	N	Y	NOTE 11
2	NB164/166/172	E111	T04N-07	9	0	1	1	1-1	NT	1	E & 12	4S-19	RETAIN EXISTNG	2	N	Y	Y	N	Y	Y	NOTES 10 & 12
3	NBC110	E111	T04N-07	9	0	1	1	1-1	NT	1	E & 12	4S-19	RETAIN EXISTNG	0	N	N	N	N	N	N	NOTE 1
4	NBC 112/114/116	E111	T04N-07	-	-	-	-	-	NT	1	E & 12	N/A	4S-19	-	-	-	-	-	N	N	NOTE 2
5	NC146	E111	T04N-02	9	0	1	2	2-1	NT	1	E & 21	E-23	STL2-19	2	N	N	N	Y	N	Y	NOTE 11
6	NC121 (TED4N)	E111	T04N-05	9	0	1	13	13-1	NT	1	D & 17	STL2-22	RETAIN EXISTNG	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM T04N
7	NC123 (T04N)	E111	T04N-05	9	0	1	13	13-1	NT	1	D & 17	STL2-22	RETAIN EXISTNG	1	Y	N	N	Y	N	N	TELECOM RM T04N
8	NC132A (T05N)	E111	T04N-04	9	0	1	14	14-1	NT	1	E & 19	STL2-22	RETAIN EXISTNG	1	Y	N	N	Y	N	N	TELECOM RM T05N
9	NC132 (TED5N)	E111	T04N-04	9	0	1	14	14-1	NT	1	E & 19	STL2-22	RETAIN EXISTNG	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM T05N
10	ND101	E111	T04N-01	9	0	1	3	3-1	NT	1	D & 22	E-23	STL2-19	2	N	N	N	Y	N	Y	NOTE 11
11	NC164	E111	T04N-01	9	0	1	3	3-1	NT	1	D & 22	E-23	STL2-19	2	N	N	N	Y	N	Y	NOTE 11
12	ND113	E111	T06N-01	9	0	1	7	7-1	NT	1	C & 28	8E-15	8S-39	2	N	N	N	Y	N	Y	NOTE 11
13	ND194	E111	T07N-01	9	0	1	6	6-1	NT	1	D & 33	8E-15	8S-37	2	N	N	N	Y	N	Y	NOTE 11
14	ND160	E111	T07N-03	9	0	1	5	5-1	NT	1	E & 32	8E-15	8S-37	2	N	N	N	Y	N	Y	NOTE 6 & 11
15	ND155 (TED7N)	E111	T07N-02	9	0	1	16	16-1	NT	1	D & 31	8S-37	RETAIN EXISTNG	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM T07N
16	ND165A (T07N)	E111	T07N-02	9	0	1	16	16-1	NT	1	D & 31	8S-37	RETAIN EXISTNG	1	Y	N	N	Y	N	N	TELECOM RM T07N
17	ND128 (T08N)	E111	T08N-03	9	0	1	17	17-1	NT	1	D & 26	8S-37	RETAIN EXISTNG	1	Y	N	N	Y	N	N	TELECOM RM T08N
18	ND116 (TED8N)	E111	T08N-03	9	0	1	17	17-1	NT	1	D & 26	8S-37	RETAIN EXISTNG	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM T08N
19	ELEV N4	E111	T08N-02	9	0	1	4	4-1	NT	1	E & 27	8E-8	8S-39	2	N	N	N	N	N	N	LEVEL 1 LOBBY & CAB. ELEV N4 IS ALSO CONNECTED TO DCC 17-2
20	ND126	E111	T08N-02	9	0	1	4	4-1	NT	1	E & 27	8E-8	8S-39	2	N	N	N	Y	N	Y	NOTE 11
21	NC137	E111	T04N-03	9	0	1	8	8-1	NT	1	B & 21	E-1	STL2-19	2	N	N	N	N	N	N	
22	NC139	E111	T04N-03	9	0	1	8	8-1	NT	1	B & 21	E-1	STL2-19	0	N	N	N	Y	N	Y	NOTE 11
23	NC115	E111	T04N-06	9	0	1	9	9-1	NT	1	D & 16	E-23	STL2-21	2	N	N	N	Y	N	Y	NOTE 11
24	NC104	E111	T04N-06	9	0	1	9	9-1	NT	1	D & 16	E-23	STL2-21	2	N	N	N	Y	N	Y	NOTE 11
25	NB147/151/153	E111	T04N-08	9	0	1	10	10-1	NT	1	B & 10	8E-4	42SPA-5	2	N	Y	Y	N	Y	Y	NOTES 10 & 12
26	NB155	E111	T04N-08	-	-	-	-	-	NT	1	B & 10	N/A	42SPA-5	-	-	-	-	-	N	N	NOTE 4
27	NAA124	E112	T01N-01	9	0	1	12	12-1	NT	1	P & 5	4E-12	20S-5	2	N	N	N	N	N	N	
28	NAA104	E112	T01N-01	9	0	1	12	12-1	NT	1	P & 5	4E-12	20S-5	2	N	N	N	N	N	N	
29	NA132	E112	T01N-02	9	0	1	11	11-1	NT	1	L & 4	2S-30	RETAIN EXISTNG	2	N	N	N	N	N	N	
30	NA126 (TED1N)	E112	T01N-02	9	0	1	11	11-1	NT	1	L & 4	2S-30	RETAIN EXISTNG	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM T01N
31	NA126B (T01N)	E112	T01N-02	9	0	1	11	11-1	NT	1	L & 4	2S-30	RETAIN EXISTNG	1	Y	N	N	Y	N	N	TELECOM RM T01N
32	NB112	E112	T02N-02	9	0	1	15	15-1	NT	1	G & 4	4E-9	3SB-2	1	N	N	N	N	N	N	NOTE 6

## ACS DOOR SCHEDULE

NO.	DOOR NO.	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDCIRIM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	POWER CIRCUIT (N)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
33	NB113	E112	T03N-01	9	0	2	1	1-2	NT	1	X & 6	3SB-8	RETAIN EXISTING	2	N	N	N	N	N	Y	NOTES 3, 6 & 11
34	NB105R (T03N)	E112	T03N-01	9	0	2	1	1-2	NT	1	X & 6	3SB-8	RETAIN EXISTING	1	Y	N	N	Y	N	N	TELECOM RM T03N
35	NB204	E122	T02N-04	9	0	2	2	2-2	NT	2	D & 5	4E-9	42SPA-1	2	N	N	N	N	N	N	
36	NB214	E122	T02N-03	9	0	2	3	3-2	NT	2	D & 7	UNKNOWN	42SPA-1	0	N	Y	N	N	Y	Y	NOTE 6 & 10
37	SCREENING PANIC/DURESS	E122	T02N-02	9	0	2	3	3-2	NT	2	D & 7	UNKNOWN	42SPA-1	0	N	N	N	N	N	N	
38	NB223	E122	T02N-02	9	0	2	3	3-2	NT	2	D & 7	UNKNOWN	42SPA-1	2	N	N	N	Y	N	Y	NOTE 11
39	NB213	E122	T02N-02	9	0	2	3	3-2	NT	2	D & 7	UNKNOWN	42SPA-1	0	N	Y	N	N	Y	Y	NOTE 10
40	NB222	E122	T08N-11	9	0	2	4	4-2	NT	2	D & 8	4E-8	42SPA-1	2	N	N	N	Y	N	Y	NOTES 6 & 11
41	NB225	E122	T08N-11	9	0	2	4	4-2	NT	2	D & 8	4E-8	42SPA-1	2	N	N	N	Y	N	Y	NOTES 6 & 11
42	NB238	E122	T08N-11	9	0	2	4	4-2	NT	2	D & 8	4E-8	42SPA-1	2	N	N	N	Y	Y	Y	NOTE 10
43	ELEV N2	E122	T08N-10	9	0	2	5	5-2	NT	2	E & 13	4E-8	42SPA-3	3	N	N	N	N	N	N	
44	NB243	E122	T08N-08	9	0	2	18	18-2	NT	2	E & 15	UNKNOWN	42SPA-3	2	N	N	N	Y	N	Y	NOTE 11
45	NC200	E122	T08N-07	9	0	2	6	6-2	NT	2	E & 16	4E-8	42SPA-3	2	N	Y	Y	Y	Y	Y	NOTE 10
46	NC202	E122	T08N-07	9	0	2	6	6-2	NT	2	E & 16	4E-8	42SPA-3	2	N	Y	Y	Y	Y	Y	NOTE 10
47	ND240	E121	T09N-06	9	0	2	11	11-2	NT	2	E & 28	8E-15	SL-36	2	N	Y	Y	N	Y	Y	NOTE 10
48	GATE N8 ND235	E121	T09N-06	9	0	2	12	12-2	NT	2	E & 29	8E-15	SL-36	1	Y	N	N	N	N	N	
49	ND260	E121	T09N-06	9	0	2	12	12-2	NT	2	E & 29	8E-15	SL-36	0	N	Y	Y	N	Y	Y	NOTE 10
50	ND251	E121	T09N-08	9	0	2	12	12-2	NT	2	E & 29	8E-15	SL-36	2	N	Y	Y	Y	Y	Y	NOTE 10
51	ND253	E121	T09N-08	9	0	2	12	12-2	NT	2	E & 29	8E-15	SL-36	2	N	N	N	Y	Y	Y	NOTE 10
52	GATE N8 ND285	E121	T09N-02	9	0	2	13	13-2	NT	2	E & 32	8E-15	SL-15	1	Y	N	N	N	N	N	
53	ND280	E121	T09N-02	9	0	2	13	13-2	NT	2	E & 32	8E-15	SL-15	2	N	Y	Y	N	Y	Y	NOTES 6 & 10
54	ND290	E121	T09N-02	9	0	2	13	13-2	NT	2	E & 32	8E-15	SL-15	2	N	Y	Y	Y	Y	Y	NOTES 10 & 12
55	ND262	E121	T09N-02	9	0	2	13	13-2	NT	2	E & 32	8E-15	SL-15	2	N	Y	Y	Y	Y	Y	NOTE 10
56	GATE N7 ND275	E121	T09N-01	9	0	2	14	14-2	NT	2	C & 32	8E-15	SL-15	1	Y	N	N	N	N	N	
57	ND270	E121	T09N-01	9	0	2	14	14-2	NT	2	C & 32	8E-15	SL-15	0	N	Y	Y	N	Y	Y	NOTE 10
58	ND250	E121	T09N-03	9	0	2	15	15-2	NT	2	C & 29	8E-15	8S-16	2	N	Y	Y	Y	Y	Y	NOTE 10
59	GATE N5 ND235	E121	T09N-03	9	0	2	15	15-2	NT	2	C & 29	8E-15	8S-16	1	Y	N	N	N	N	N	
60	ND237	E121	T09N-03	9	0	2	15	15-2	NT	2	C & 29	8E-15	8S-16	2	N	Y	N	Y	Y	Y	NOTES 10 & 12
61	ND230	E121	T09N-04	9	0	2	16	16-2	NT	2	C & 27	UNKNOWN	8S-16	2	N	Y	Y	N	Y	Y	NOTE 10
62	ND210	E121	T09N-04	9	0	2	16	16-2	NT	2	C & 27	UNKNOWN	8S-16	0	N	Y	Y	N	Y	Y	NOTE 10
63	ND209	E121	T09N-04	9	0	2	16	16-2	NT	2	C & 27	UNKNOWN	8S-16	2	N	Y	N	Y	Y	Y	NOTES 10 & 12
64	ND201	E121	T09N-04	9	0	2	16	16-2	NT	2	C & 27	UNKNOWN	8S-16	2	N	Y	N	Y	Y	Y	NOTES 10 & 12

## ACS DOOR SCHEDULE

NO.	DOOR NO.	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDC/RM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	POWER CIRCUIT (N)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
65	ND340	E123	T09N-11	9	0	2	7	7-2	NT	3	E & 27	8E-15	8S-18	2	N	Y	Y	N	Y	Y	NOTES 6 & 10
66	ND330	E123	T09N-11	9	0	2	7	7-2	NT	3	E & 27	8E-15	8S-18	2	N	Y	Y	N	Y	Y	NOTE 10
67	ND314 (T09N)	E131	T09N-10	9	0	2	19	19-2	NT	3	E & 30	STL3-10	RETAIN EXISTING	1	Y	N	N	Y	N	N	TELECOM RM T09N
68	ND315 (TE09N)	E131	T09N-10	9	0	2	19	19-2	NT	3	E & 30	STL3-10	RETAIN EXISTING	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM TE09N
69	ELEV N4	E131	T09N-12	9	0	2	17	17-2	NT	3	E & 27	8E-15	8S-18	2	N	N	N	N	N	N	LEVEL 2 & 3 LOBBIES ELEV N4 IS ALSO CONNECTED TO IDC 4-1.
70	ND322	E131	T09N-12	9	0	2	17	17-2	NT	3	E & 27	8E-15	8S-18	2	N	Y	N	N	Y	Y	NOTES 7 & 10
71	ND300	E131	T09N-12	9	0	2	8	8-2	NT	3	E & 22	E-15	STL3-17	0	N	N	N	N	N	Y	NOTES 5 & 11
72	NC380	E131	T09N-12	9	0	2	8	8-2	NT	3	E & 22	E-15	STL3-17	0	N	N	N	N	N	Y	NOTES 5 & 11
73	NC328	E131	T09N-13	9	0	2	10	10-2	NT	3	E & 20	E-23	STL3-17	2	N	N	N	Y	N	Y	NOTE 11
74	NC322	E131	T09N-13	9	0	2	9	9-2	NT	3	E & 21	E-23	STL3-17	2	N	N	N	N	N	N	
75	NC261	E122	T09N-01	9	0	3	1	1-3	NT	2	C & 20	E-23	STL3-11	2	N	N	N	N	N	Y	NOTE 11
76	NC271	E121	T09N-01	9	0	3	1	1-3	NT	2	C & 20	E-23	STL3-11	2	N	N	N	N	N	N	
77	NC230	E122	T09N-01	9	0	3	2	2-3	NT	2	C & 20	E-23	STL3-11	0	N	Y	Y	N	Y	Y	NOTE 10
78	GATE N3 NC235	E122	T09N-01	9	0	3	2	2-3	NT	2	C & 20	E-23	STL3-11	1	Y	N	N	N	N	N	
79	NC250	E122	T09N-01	9	0	3	2	2-3	NT	2	C & 20	E-23	STL3-11	0	N	Y	Y	N	Y	Y	NOTE 10
80	GATE N1C NC209	E122	T09N-09	9	0	3	3	3-3	NT	2	C & 15	4E-8	42SPA-3	1	Y	N	N	N	N	N	
81	NB270	E122	T09N-09	9	0	3	3	3-3	NT	2	C & 15	4E-8	42SPA-3	0	N	Y	Y	N	Y	Y	NOTE 10
82	NB227	E122	T09N-09	9	0	3	3	3-3	NT	2	C & 15	4E-8	42SPA-3	2	N	N	N	Y	N	N	
83	NC210	E122	T09N-05	9	0	3	4	4-3	NT	2	B & 16	4E-8	42SPA-3	2	N	Y	Y	N	Y	Y	NOTE 10
84	NC201	E122	T09N-05	9	0	3	4	4-3	NT	2	B & 16	4E-8	42SPA-3	2	N	N	N	Y	N	Y	NOTE 11
85	NA310A	E131	T02N-05	9	0	3	5	5-3	NT	3	E & 4	4E-8	3SB-2	1	Y	N	N	N	N	N	NOTE 11
86	NB112 ROOF ACCESS	E131	T02N-05	9	0	3	5	5-3	NT	3	E & 4	4E-8	3SB-2	1	Y	N	N	N	N	N	
87	ND380	E131	T09N-09	9	0	3	6	6-3	NT	3	E & 32	8E-15	SL-38	2	N	Y	Y	N	Y	Y	NOTE 10
88	ND370	E131	T09N-09	9	0	3	6	6-3	NT	3	E & 32	8E-15	SL-38	2	N	Y	Y	N	Y	Y	NOTE 10
89	NC220	E122	T09N-06	9	0	3	7	7-3	NT	2	E & 16	4E-8	42SPA-5	2	N	Y	Y	N	Y	Y	NOTE 10
90	GATE N2 NC208	E122	T09N-06	9	0	3	7	7-3	NT	2	E & 16	4E-8	42SPA-5	1	Y	N	N	N	N	N	
91	NB280	E122	T09N-06	9	0	3	7	7-3	NT	2	E & 16	4E-8	42SPA-5	0	N	Y	Y	N	Y	Y	NOTE 10
92	ELEV 3	E122	T09N-03	9	0	3	8	8-3	NT	2	E & 21	E-23	STL3-11	2	N	N	N	N	N	N	
93	GATE N4 NC275	E122	T09N-04	9	0	3	9	9-3	NT	2	E & 21	E-23	STL3-11	1	Y	N	N	N	N	N	
94	NC240	E122	T09N-04	9	0	3	9	9-3	NT	2	E & 21	E-23	STL3-11	0	N	Y	Y	N	Y	Y	NOTE 10
95	NC260	E122	T09N-04	9	0	3	9	9-3	NT	2	E & 21	E-23	STL3-11	2	N	Y	Y	N	Y	Y	NOTE 10
96	NC273	E122	T09N-04	9	0	3	9	9-3	NT	2	E & 21	E-23	STL3-11	2	N	Y	Y	Y	Y	Y	NOTE 10

## ACS DOOR SCHEDULE

NO.	DOOR NO.	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	DC/RM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	POWER CIRCUIT (N)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
97	NC232	E122	T08N-03	9	0	3	9	9-3	NT	2	E & 21	E-23	STL3-11	2	N	Y	N	Y	Y	Y	NOTE 10
98	ND220	E121	T08N-05	9	0	3	10	10-3	NT	2	E & 25	E-23	STL3-13	2	N	Y	Y	N	Y	Y	NOTE 10
99	NC320	E131	T08N-15	9	0	3	11	11-3	NT	3	E & 17	E-23	42SPA-7	2	N	Y	Y	N	Y	Y	NOTE 10
100	NC310	E131	T08N-15	9	0	3	11	11-3	NT	3	E & 17	E-23	42SPA-7	2	N	Y	Y	N	Y	Y	NOTE 10
101	NC312B	E131	T08N-15	9	0	3	14	14-3	NT	3	E & 17	E-23	42SPA-7	1	Y	N	N	N	N	N	
102	NC313 (T08N)	E131	T08N-15	9	0	3	14	14-3	NT	3	E & 17	E-23	42SPA-7	1	Y	N	N	Y	N	N	TELECOM RM T08N
103	NA162A (T02N)	E112	T02N-01	9	0	3	12	12-3	NT	1	E & 4	3E-6	3SB-2	1	Y	N	N	Y	N	N	TELECOM RM T02N
104	NA162 (TE02N)	E112	T02N-01	9	0	3	12	12-3	NT	1	E & 4	3E-6	3SB-2	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM TE02N
105	NA184	E112	T02N-01	9	0	3	13	13-3	NT	1	E & 4	3E-9	3SB-2	2	Y	N	N	N	N	Y	NOTE 11
106	NT EMPLOYEE LOT	E008	T03N-02	9	0	3	15	15-3	NT	N/A	AT GATE	35-26	RETAIN EXISTING	1	Y	N	N	N	N	N	
107	NB028 (T00N)	E101	SE00N-01	9	0	5	14	14-5	NT	0	D & 6	3SB-7	RETAIN EXISTING	1	Y	N	N	Y	Y	N	MAIN TELECOM RM T00N NOTE 10.
108	I/O LINK	E101	SE00N-01	9	0	5	14	14-5	NT	0	D & 6	3SB-7	RETAIN EXISTING	0	N	N	N	N	N	N	FIRE ALARM RESET
109	NB014 (TE00N)	E101	SE00N-01	9	0	5	17	17-5	NT	0	E & 5	3SB-7	RETAIN EXISTING	1	Y	N	N	Y	N	N	MAIN TELECOM EQUIPMENT RM TE00N
110	NB024 (SE00N)	E101	SE00N-01	9	0	5	18	18-5	NT	0	D2 & 5	3SB-5	RETAIN EXISTING	1	Y	N	N	Y	N	N	MAIN SECURITY EQUIPMENT RM SE00N

## NOTES

1. PROVIDE CARD READER FOR ENABLE CONTROL OF OVERHEAD DOOR. REFER TO SHEET E111 AND SPECIFICATION SECTION 13710 FOR ADDITIONAL INFORMATION.
2. PROVIDE CARD READER FOR ENABLE CONTROL OF OVERHEAD DOORS. REFER TO SHEET E111 AND SPECIFICATION SECTION 13710 FOR ADDITIONAL INFORMATION.
3. CONVERT DOOR NB113 TO A DELAYED EGRESS DOOR. REFER TO SHEET E112 AND SPECIFICATION SECTION 13710 FOR ADDITIONAL INFORMATION.
4. PROVIDE ACCESS CONTROL OF DOOR NB155. REFER TO SHEET E111 AND SPECIFICATION SECTION 13710 FOR ADDITIONAL INFORMATION.
5. DOOR NOT PRESENTLY CONNECTED TO ACCESS CONTROL SYSTEM. CONFIGURE DOOR AND MAKE PROVISIONS FOR FUTURE CONNECTION TO ACCESS CONTROL SYSTEM.
6. REPLACE EXISTING SURFACE MOUNTED RACEWAY WITH CONCEALED CONDUIT IAW SECURITY DOOR DETAILS.
7. CONVERT DOOR ND322 TO A NON DELAYED EGRESS DOOR. REPLACE VON DUPRIN CHEXIT DEVICE WITH AN EMERGENCY EXIT PANIC BAR. REFER TO SPECIFICATION SECTION 13710.
8. GENERAL NOTE: REUSE EXISTING IDC POWER CIRCUITS FOR DBCs WHERE NOTED. PROVIDE NEW POWER CIRCUITS FOR DBCs WHERE NOTED. DEMOLISH EXISTING CIRCUITS WHERE NEW CIRCUITS ARE PROVIDED. FIELD VERIFY ALL EXISTING AND NEW CIRCUITS PRIOR TO CUTOVER FROM EXISTING IDC TO DBC.
9. GENERAL NOTE: REFER TO DETAILS ON SHEET E502 FOR ADDITIONAL INFORMATION ON NORTH TERMINAL DOOR CUTOVERS.
10. CONNECT EXISTING FIRE ALARM RELAY MODULE TO DOOR TO UNLOCK DOOR IAW SPECIFICATION SECTION 13710 AND DETAILS ON SHEET E502.
11. PROVIDE FIRE ALARM RELAY MODULE AND CONNECT TO DOOR TO UNLOCK DOOR IAW SPECIFICATION SECTION 13710 AND DETAILS ON SHEET E502.
12. REPLACE EXISTING VON DUPRIN "CHEXIT" DEVICE WITH VON DUPRIN DE5101 DELAYED EGRESS SYSTEM AS NOTED ON DRAWINGS (FLOOR PLANS & DETAILS ON SHEET E504) AND IN SPECIFICATION SECTION 13710.

# **South Terminal Concourses A & B and Main Terminal**

## ACS DOOR SCHEDULE

NO.	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDC/IM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	POWER CIRCUIT (N)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
1	SG121	E201	T19-01	-	-	-	-	-	ST-MT	0	X & 2	N/A	SP-29	-	-	-	-	-	-	-	NOTE 5
2	ELEV 2 CAB	E222	T15-07	10	1	3	6	6-3	ST-MT	2	MN & M12 LEVEL 1	E-15	01SPC-13 (SPC)	1	N	N	N	N	N	N	
3	ELEV 2 LEVEL 2 LOBBY	E222	T15-07	10	1	3	6	6-3	ST-MT	2	MN & M12 LEVEL 1	E-15	01SPC-13 (SPC)	1	N	N	N	N	N	N	
4	SA1360 (LS1E29) (LS1106)	E212	T15-03	10	1	3	7	7-3	ST-MT	1	MN & M14	SPA-40	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 3 & 12
5	SA1354A (LS1E63) (LS1187)	E212	T15-03	10	1	3	7	7-3	ST-MT	1	MN & M14	SPA-40	RETAIN EXISTING	1	Y	N	N	N	N	N	
6	SA1340 (LS1F29) (LS1196)	E212	T15-04	10	1	3	8	8-3	ST-MT	1	MN & M14	SPA-40	RETAIN EXISTING	2	N	N	N	N	N	N	
7	SA1364 (LS1E31) (LS1165)	E212	T15-05	10	1	3	9	9-3	ST-MT	1	MN & M17	SPA-40	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 3 & 12
8	SA1370 (LS1E65) (LS1138)	E212	T15-05	10	1	3	9	9-3	ST-MT	1	MN & M17	SPA-40	RETAIN EXISTING	2	N	N	N	N	N	N	
9	SA1368 (LS1D96) (LS1153)	E212	T15-09	10	1	3	10	10-3	ST-MT	1	MN & M17	SPA-40	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 3 & 12
10	SA1424 (LS1D17) (LS1126)	E212	T15-09	10	1	3	10	10-3	ST-MT	1	MN & M17	SPA-38	RETAIN EXISTING	2	N	N	N	N	N	N	
11	SA1450 (LS1C30) (LS1097)	E212	T15-06	10	1	3	11	11-3	ST-MT	1	MN & M21	SPA-38	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 3 & 12
12	SA1430A (LS1C29) (LS1109)	E212	T15-06	10	1	3	11	11-3	ST-MT	1	MN & M21	SPA-38	RETAIN EXISTING	2	N	N	N	N	N	N	
13	SA1450C (LS1B65) (LS1062)	E211	T15-10	10	1	3	12	12-3	ST-MT	1	MN & M21	SPA-38	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 3 & 12
14	SA1450B (LS1C32) (LS1096)	E212	T15-10	10	1	3	12	12-3	ST-MT	1	MN & M21	SPA-38	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 3 & 12
15	SA1520A (LS1B27) (LS1042)	E211	T16-08	10	1	3	13	13-3	ST-MT	1	MN & M24	SPA-38	RETAIN EXISTING	2	N	N	N	N	N	N	
16	A SCREEN DURESS	E221	T16-08	10	1	3	13	13-3	ST-A	2	MN & M24 LEVEL 1	SPA-38	RETAIN EXISTING	N	N	N	N	N	N	N	
17	SA1550 (LS1A64)	E211	T16-09	10	1	3	14	14-3	ST-A	1	MN & M27	FX-14	01SPC-6 (SPH)	2	N	N	N	N	N	Y	NOTE 13
18	SA2560 (SA2700)	E221	T16-09	10	1	3	14	14-3	ST-A	2	MN & M27 LEVEL 1	FX-14	01SPC-6 (SPH)	2	N	Y	Y	Y	Y	Y	NOTES 3 & 12
19	SA2709 (SA2760)	E221	T17-13	10	1	4	1	1-4	ST-A	2	MN & M30	EG-4	101SPA-22	2	N	Y	Y	Y	Y	Y	NOTES 3 & 12
20	SA2855 (SA2870)	E221	T17-14	10	1	4	2	2-4	ST-A	2	A7 & A38	EH-14	101SPA-22	2	N	Y	Y	Y	Y	Y	NOTES 3, 6 & 12
21	SA2860 (SA2940)	E221	T17-17	10	1	4	3	3-4	ST-A	2	AV & A48	EH-14	101SPA-24	2	N	Y	Y	Y	Y	Y	NOTES 3, 6 & 12
22	SA2970 GATE A7 (SA2950)	E221	T17-17	10	1	4	3	3-4	ST-A	2	AV & A48	EH-14	101SPA-24	1	Y	N	N	N	N	N	
23	SA2944 GATE A6	E221	T17-16	10	1	4	19	19-4	ST-A	2	AV & A41	UNKNOWN	101SPA-24	1	Y	N	N	N	N	N	
24	SA2955 GATE A8 (SA2960)	E221	T17-16	10	1	4	4	4-4	ST-A	2	AV & A45	EH-14	101SPA-24	1	Y	N	N	N	N	N	
25	SA2920	E221	T17-15	10	1	4	5	5-4	ST-A	2	AV & A41	EH-14	101SPA-24	2	N	Y	Y	Y	Y	Y	NOTES 3, 6 & 12

## ACS DOOR SCHEDULE

NO.	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDC/RM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	POWER CIRCUIT (N)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
26	SA1910 GATE A11 (SA1946)	E211	T17-15	10	1	4	5	5-4	ST-A	1	AV & A41 LEVEL 2	EH-14	101SPA-24	2	N	N	Y	N	Y	Y	NOTES 6 & 12
27	SA2840 (SA2890)	E221	T17-16	10	1	4	4	4-4	ST-A	2	AV & A42	EH-14	101SPA-24	2	N	Y	Y	N	Y	Y	NOTES 3, 6 & 12
28	SA1611 (SA1675)	E211	T17-02	10	1	4	6	6-4	ST-A	1	MO & M29	EG-4	101SPA-22	2	N	N	N	N	N	N	
29	SA1641 (SA1670)	E211	T17-02	10	1	4	6	6-4	ST-A	1	MO & M29	EG-4	101SPA-22	2	N	N	N	N	N	N	
30	S/A	E211	T17-01	10	1	4	15	15-4	ST-A	1	MP & M29	UNKNOWN	101SPA-22	1	N	N	N	N	N	N	OVERHEAD DOOR
31	SA1740 (SA1753)	E211	T17-03	10	1	4	7	7-4	ST-A	1	MM.5 & M30	EG-4	101SPA-20	2	N	N	N	N	N	Y	NOTE 13
32	SA1737 (SA1720)	E211	T17-03	10	1	4	8	8-4	ST-A	1	MM.5 & M30	EG-4	101SPA-20	2	N	N	Y	N	N	Y	NOTES 6 & 13
33	SA1735 (SA1730)	E211	T17-03	10	1	4	8	8-4	ST-A	1	MM.5 & M30	EG-4	101SPA-20	2	N	Y	Y	Y	Y	Y	NOTES 3, 6 & 12
34	SA1760 (SA1767)	E211	T17-04	10	1	4	9	9-4	ST-A	1	AU & A35	EG-14	101SPA-20	2	N	N	N	N	Y	Y	NOTES 6 & 12
35	SA1745 (SA1760)	E211	T17-04	-	-	-	-	-	ST-A	1	AU & A35	EG-14	101SPA-20	-	-	-	-	-	-	-	NOTE 4
36	SA1835 (SA1800)	E211 E612	T17-07	10	1	4	10	10-4	ST-A	1	AT & A38	UNKNOWN	101SPA-3	2	N	N	N	Y	N	Y	NOTES 6 & 13
37	SA185A2 (SA180A2) (TE17)	E211 E612	T17-07	10	1	4	13	13-4	ST-A	1	AT & A39	UNKNOWN	101SPA-3	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM TE17
38	SA185A2A (SA180A2A) (T17)	E211 E612	T17-07	10	1	4	13	13-4	ST-A	1	AT & A39	UNKNOWN	101SPA-3	1	Y	N	N	Y	N	N	TELECOM RM T17
39	SA1845 (SA1820)	E211	T17-06	10	1	4	11	11-4	ST-A	1	AV & A40	UNKNOWN	101SPA-3	2	N	Y	N	Y	Y	Y	NOTES 3, 6 & 12
40	SA1893 GATE A14 (SA1820)	E211	T17-09	10	1	4	12	12-4	ST-A	1	AX & A44	EH-14	101SPA-18	2	N	Y	N	Y	Y	Y	NOTES 3, 6 & 12
41	SA1843 GATE A12 (SA1860)	E211	T17-09	10	1	4	12	12-4	ST-A	1	AX & A44	EH-14	101SPA-18	2	N	Y	N	Y	Y	Y	NOTES 3, 6 & 12
42	SA1877 GATE A15 (SA1850)	E211	T17-11	10	1	4	14	14-4	ST-A	1	AW & A48	EH-14	101SPA-18	2	N	Y	N	Y	Y	Y	NOTES 3, 6 & 12
43	SA3121 (LS3G16) (SA3020)	E231	T20-12	10	1	5	4	4-5	ST-MT	3	MM.5 & M10	EO-13	013SPD-20	2	Y	N	N	Y	Y	Y	NOTES 6 & 12 KEYPAD
44	SA3125 (LS3G28) (SA3040)	E231	T20-12	10	1	5	4	4-5	ST-MT	3	MM.5 & M10	EO-13	013SPD-20	1	Y	N	N	N	N	N	
45	SA3130 (LS3G01) (SA3110)	E231	T20-12	10	1	5	5	5-5	ST-MT	3	MM & M10	EO-13	013SPD-20	1	Y	N	N	N	N	N	
46	SA3280 (LS3E39) (SA3223)	E231	T20-11	10	1	5	6	6-5	ST-MT	3	MM & M15 LEVEL3	EO-13	013SPD-20	2	N	Y	N	Y	Y	Y	NOTES 3, 6 & 12
47	SA2392 (LS2E30) (SA2380)	E222	T20-11	10	1	5	7	7-5	ST-MT	2	MM & M15 LEVEL3	EO-13	013SPD-20	2	N	Y	Y	N	Y	Y	NOTES 3, 6 & 12
48	SA1382 (LS1E65) (LS1168)	E212	T20-11	10	1	5	7	7-5	ST-A	1	MM & M15 LEVEL3	EO-13	013SPD-20	2	N	N	N	Y	N	Y	NOTES 6 & 13
49	SA3650 (LS3A35) (SA3730)	E231	T16-07	10	1	5	8	8-5	ST-MT	3	MM & M26	EO-13	013SPC-6 (SPH)	2	N	Y	N	Y	Y	Y	NOTES 3 & 12
50	SA3615	E231	T16-07	10	1	5	8	8-5	ST-MT	3	MM & M26	EO-13	013SPC-6 (SPH)	1	Y	N	N	N	N	N	
51	SA1880 (SA1860)	E211	T17-11	10	1	5	9	9-5	ST-A	1	AW & A48	EH-14	101SPA-16	2	N	N	N	Y	N	Y	NOTES 6 & 13

## ACS DOOR SCHEDULE

NO.	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDC/IRM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	POWER CIRCUIT (N)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
52	SA1984 GATE A16 (SA1970)	E211	T17-11	10	1	5	9	9-5	ST-A	1	AV & A48	EH-14	101SPA-16	2	N	N	N	N	N	Y	NOTES 6 & 13
53	SA1980 (SA1960)	E211	T17-12	10	1	5	10	10-5	ST-A	1	AV & A44	EH-14	101SPA-16	2	N	N	N	Y	Y	Y	NOTES 6 & 12
54	GATES A8 & A13 (SA1910)	E211	T17-12	10	1	5	10	10-5	ST-A	1	AV & A44	EH-14	101SPA-16	2	N	N	N	N	N	Y	NOTES 6 & 13
55	SA1920 GATE A5 (SA1850)	E211	T17-08	10	1	5	11	11-5	ST-A	1	AV & A40	UNKNOWN	101SPA-16	2	N	N	N	Y	N	Y	NOTES 6 & 13
56	A SCREEN ENTRY (LS2A09)	E221	T16-10	10	1	5	13	13-5	ST-A	2	MO & M27 LEVEL 1	EF-14	013SPC-6 (SPH)	0	N	N	N	N	N	N	MONITOR STATUS OF OVERHEAD COLLING DOOR
57	A SCREEN EXIT SA2620 (LS2A07)	E221	T16-10	10	1	5	13	13-5	ST-A	2	MO & M27 LEVEL 1	EF-14	013SPC-6 (SPH)	2	N	N	Y	Y	Y	Y	NOTE 12
58	SA1530 (LS1A17)	E211	T16-10	10	1	5	12	12-5	ST-A	1	MO & M27	EF-14	013SPC-6 (SPH)	2	N	N	N	N	N	N	
59	SB1970 (SB1970)	E213	T18-01	-	-	-	-	-	ST-B	1	B4 & BFC	061SPD-5	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 1, 6 & 12
60	SB2730 GATE B3 (SB2420)	E223	T18-09	-	-	-	-	-	ST-B	2	B4 & BBB LEVEL 1	061SPD-5	RETAIN EXISTING	1	Y	N	Y	N	N	N	NOTE 1
61	SB2630 GATE B1 (SB2410)	E223	T18-11	-	-	-	-	-	ST-B	2	B4 & BCC LEVEL 1	031SPD-17	RETAIN EXISTING	1	Y	N	Y	N	N	N	NOTE 1
62	SA1010 (SB2950)	E212	T21-08	-	-	-	-	-	ST-B	1	B2 & MM.5	031SPB-3	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
63	GATE B7 (SB2620)	E223	T18-03	-	-	-	-	-	ST-B	2	B3 & BJ LEVEL 1	061SPD-1	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
64	SB2850 GATE B5 (SB2610)	E223	T18-02	-	-	-	-	-	ST-B	2	B2 & BE LEVEL 1	061SPD-1	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
65	SB1980 (SB1740)	E213	T18-02	-	-	-	-	-	ST-B	1	B2 & BE	061SPD-1	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
66	SB1988	E213	T18-02	-	-	-	-	-	ST-B	1	B2 & BE	061SPD-1	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 1 & 12
67	SB1930	E213	T18-04	-	-	-	-	-	ST-B	1	B6 & BJ	061SPD-1	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
68	SB1960 (SB1790)	E213	T18-04	-	-	-	-	-	ST-B	1	B6 & BJ	061SPD-1	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
69	SB1940 (SB1766)	E213	T18-03	-	-	-	-	-	ST-B	1	B3 & BJ	061SPD-1	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
70	SB1946	E213	T18-03	-	-	-	-	-	ST-B	1	B3 & BJ	061SPD-1	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
71	SB1958B (SB1960)	E213	T18-06	-	-	-	-	-	ST-B	1	B8 & BD	061SPD-3	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
72	SB1973	E213	T18-06	-	-	-	-	-	ST-B	1	B8 & BD	061SPD-3	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 1 & 12
73	SB2985 GATE B9 (SB2530)	E223	T18-05	-	-	-	-	-	ST-B	2	B7 & BJ LEVEL 1	061SPD-3	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
74	SB1970 (SB1670)	E213	T18-05	-	-	-	-	-	ST-B	1	B7 & BJ	061SPD-3	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
75	SB1978	E213	T18-05	-	-	-	-	-	ST-B	1	B7 & BJ	061SPD-3	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 1 & 12
76	SB2525 GATE B2 (SB2140)	E223	T18-12	-	-	-	-	-	ST-B	2	B1 & BEE LEVEL 1	031SPD-17	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
77	SB2685 GATE B4 (SB2340)	E223	T18-10	-	-	-	-	-	ST-B	2	B1 & BBB LEVEL 1	061SPD-7	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1



## ACS DOOR SCHEDULE

NO.	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDC/IRM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	POWER CIRCUIT (N)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
78	SB1005 (SB1006)	E213	T18-07	-	-	-	-	-	ST-B	1	B8 & B8	061SPD-5	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 1 & 12
79	SB2835 GATE B8 (SB2510)	E223	T18-13	-	-	-	-	-	ST-B	2	B8 & B8 LEVEL 1	061SPD-3	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
80	SB2945 GATE B8 (SB2520)	E223	T18-05	-	-	-	-	-	ST-B	2	B7 & B7	061SPD-3	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
81	SB1955 (SB1910A)	E213	T18-13	-	-	-	-	-	ST-B	1	B8 & B8	061SPD-3	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
82	SA2424	E222	T16-03	-	-	-	-	-	ST-MT	2	MM.5 & M22	012SPA-14	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
83	SA2536	E221	T16-05	-	-	-	-	-	ST-B	2	MM.5 & M25	012SPA-16	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
84	SA2532	E221	T16-04	-	-	-	-	-	ST-B	2	MM.5 & M25	012SPA-16	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
85	SA2522	E221	T16-04	-	-	-	-	-	ST-B	2	MM.5 & M25	012SPA-16	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
86	SA2456	E221	T16-11	-	-	-	-	-	ST-B	2	MM.5 & M22	012SPA-14	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
87	SA2454	E221	T16-11	-	-	-	-	-	ST-B	2	MM.5 & M22	012SPA-14	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
88	SA2450B	E221	T16-03	-	-	-	-	-	ST-B	2	MM.5 & M22	012SPA-14	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
89	SA2448	E222	T16-03	-	-	-	-	-	ST-MT	2	MM.5 & M22	012SPA-14	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
90	SA2380	E222	T16-02	-	-	-	-	-	ST-MT	2	MM.5 & M20	012SPA-14	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
91	SA2352	E222	T16-02	-	-	-	-	-	ST-MT	2	MM.5 & M20	012SPA-14	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
92	BAG DOOR 2	E222	T20-06	-	-	-	-	-	ST-MT	2	MM.5 & M10	012SPA-15	RETAIN EXISTING	1	N	N	N	N	N	N	NOTE 1 OVERHEAD DOOR.
93	BAG DOOR 3	E222	T20-06	-	-	-	-	-	ST-MT	2	MM.5 & M10	012SPA-15	RETAIN EXISTING	1	N	N	N	N	N	N	NOTE 1 OVERHEAD DOOR.
94	BAG DOOR 4	E222	T20-08	-	-	-	-	-	ST-MT	2	MM.5 & M12	012SPA-17	RETAIN EXISTING	1	N	N	N	N	N	N	NOTE 1 OVERHEAD DOOR.
95	SA2344	E222	T16-01	-	-	-	-	-	ST-MT	2	MM.5 & M16	012SPA-17	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
96	SA2340	E222	T16-01	-	-	-	-	-	ST-MT	2	MM.5 & M16	012SPA-17	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
97	SA2320	E222	T20-08	-	-	-	-	-	ST-MT	2	MM.5 & M12	012SPA-17	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
98	SA2300	E222	T20-07	-	-	-	-	-	ST-MT	2	MM.5 & M12	012SPA-17	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
99	SA2270	E222	T20-07	-	-	-	-	-	ST-MT	2	MM.5 & M12	012SPA-17	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
100	SA2220	E222	T20-06	-	-	-	-	-	ST-MT	2	MM.5 & M10	012SPA-15	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
101	SA2210	E222	T20-06	-	-	-	-	-	ST-MT	2	MM.5 & M10	012SPA-15	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
102	SA2180	E222	T20-05	-	-	-	-	-	ST-MT	2	MM.5 & M10	012SPA-15	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
103	SA2170C	E222	T20-05	-	-	-	-	-	ST-MT	2	MM.5 & M10	012SPA-15	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
104	SA2150	E222	T20-05	-	-	-	-	-	ST-MT	2	MM.5 & M10	012SPA-15	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
105	TSA CS PANIC/DURESS	E222	T20-01	-	-	-	-	-	ST-MT	2	MM & B4 LEVEL 1	031SPB-5	RETAIN EXISTING	N	N	N	N	N	N	N	NOTE 1
106	TSA CS EMPLOYEE VALIDATION	E222	T20-01	-	-	-	-	-	ST-MT	2	MM & B4 LEVEL 1	031SPB-5	RETAIN EXISTING	1	N	N	N	N	N	N	NOTE 1
107	SB2130 SB2134 SB2138	E222	T20-01	-	-	-	-	-	ST-MT	2	MM & B4 LEVEL 1	031SPB-5	RETAIN EXISTING	1	N	N	N	N	N	N	NOTE 1 OVERHEAD DOORS AT MAIN TERMINAL SCREENING

## ACS DOOR SCHEDULE

NO.	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DRG (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDC/RIM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	POWER CIRCUIT (N)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
108	BAG DOOR 1	E222	T20-02	-	-	-	-	-	ST-MT	2	MM 5 & M5 LEVEL 1	03ISPB-5	RETAIN EXISTING	1	N	N	N	N	N	N	NOTE 1, OVERHEAD DOOR.
109	SA2106	E222	T20-04	-	-	-	-	-	ST-MT	2	BL & M7 LEVEL 1	03ISPB-3	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
110	SA2108	E222	T20-04	-	-	-	-	-	ST-MT	2	BL & M7 LEVEL 1	03ISPB-3	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
111	SB2158 (SB2154)	E222	T21-05	-	-	-	-	-	ST-MT	2	BK & B1	03ISPB-3	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
112	SB2338	E222	T21-04	-	-	-	-	-	ST-MT	2	BJ & B6	03SPD-19	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 1 & 12
113	SB2660	E223	T18-11	-	-	-	-	-	ST-B	2	B4 & BCC LEVEL 1	03SPD-17	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 1 & 12
114	SB2625	E223	T18-12	-	-	-	-	-	ST-B	2	B1 & BEE LEVEL 1	03SPD-17	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 1 & 12
115	SB2440	E223	T21-01	-	-	-	-	-	ST-B	2	BG & B4 LEVEL 1	03SPD-19	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
116	SB2425	E223	T21-02	-	-	-	-	-	ST-B	2	B1 & BGG LEVEL 1	03SPD-19	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1, TELECOM EQUIPMENT RM TE21.
117	SB2425A	E223	T21-02	-	-	-	-	-	ST-B	2	B1 & BGG LEVEL 1	03SPD-19	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1, TELECOM RM T21.
118	SB2445	E223	T21-02	-	-	-	-	-	ST-B	2	B1 & BGG LEVEL 1	03SPD-19	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
119	SB2817	E612	T18-07	-	-	-	-	-	ST-B	2	B9 & B9 LEVEL 1	061SPD-5	RETAIN EXISTING	1	Y	N	N	Y	N	N	SEE NOTE 1, TELECOM RM T18.
120	SB2815	E223	T18-07	-	-	-	-	-	ST-B	2	B9 & B9 LEVEL 1	061SPD-5	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1, TELECOM EQUIPMENT RM TE18.
121	SB2795	E223	T18-08	-	-	-	-	-	ST-B	2	B1 & BA LEVEL 1	061SPD-7	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
122	SB2765	E223	T18-08	-	-	-	-	-	ST-B	2	B1 & BA LEVEL 1	061SPD-7	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
123	SB2765	E223	T18-08	-	-	-	-	-	ST-B	2	B1 & BA LEVEL 1	061SPD-7	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
124	SB2735	E223	T18-10	-	-	-	-	-	ST-B	2	B1 & BBB LEVEL 1	061SPD-7	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1
125	SA1150	E212	T20-02	-	-	-	-	-	ST-MT	1	MM 5 & M5	03ISPB-5	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
126	SB1110	E212	T21-08	-	-	-	-	-	ST-MT	1	B2 & MM 5	03ISPB-3	RETAIN EXISTING	2	N	Y	Y	Y	Y	Y	NOTES 1 & 12
127	SB1230	E212	T21-07	-	-	-	-	-	ST-MT	1	B1 & BKK	03ISPB-3	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
128	SB1230A	E212	T21-06	-	-	-	-	-	ST-MT	1	B4 & BK	03ISPB-3	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
129	S11	E212	T15-02	-	-	-	-	-	ST-MT	1	MM 5 & M12	011SPD-7	RETAIN EXISTING	1	N	N	N	N	N	N	NOTE 1, OVERHEAD DOOR.
130	SA1270	E212	T15-02	-	-	-	-	-	ST-MT	1	MM 5 & M12	011SPD-7	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
131	SA1264	E212	T15-02	-	-	-	-	-	ST-MT	1	MM 5 & M12	011SPD-7	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
132	SA1282	E212	T15-01	-	-	-	-	-	ST-MT	1	MN & M12	011SPD-7	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
133	SA1344	E212	T15-08	-	-	-	-	-	ST-MT	1	MN & M14	011SPD-7	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1, TELECOM EQUIPMENT RM TE15.
134	SA1348	E611	T15-08	-	-	-	-	-	ST-MT	1	MN & M14	011SPD-7	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1, TELECOM RM T15.

## ACS DOOR SCHEDULE

NO.	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDCRIM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	POWER CIRCUIT (N)	CARD READERS (E)	RTX (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
135	SA3123A (T20)	E231 E613	T20-10	-	-	-	-	-	ST-MT	3	MN 6 & M10	011SPD-10	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1. TELECOM RM T20.
136	SA3127A (T20)	E231 E613	T20-10	-	-	-	-	-	ST-MT	3	MN 6 & M10	011SPD-10	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1. TELECOM EQUIPMENT RM T20.
137	SA3321	E231	T20-09	-	-	-	-	-	ST-MT	3	MM 5 & M13 LEVEL 2	012SPA-17	RETAIN EXISTING	2	N	N	N	Y	Y	Y	NOTES 1 & 12
138	SA3455B	E231 E611	T16-06	-	-	-	-	-	ST-MT	3	MM 5 & M22 LEVEL 2	012SPA-14	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1. TELECOM RM T16.
139	SA3475	E231 E611	T16-06	-	-	-	-	-	ST-MT	3	MM 5 & M22 LEVEL 2	012SPA-14	RETAIN EXISTING	1	Y	N	N	Y	N	N	NOTE 1. TELECOM EQUIPMENT RM T16.
140	SA2050	E222	T20-03	-	-	-	-	-	ST-MT	2	MM 5 & M5 LEVEL 1	031SPB-5	RETAIN EXISTING	2	N	N	N	Y	N	N	NOTE 1
NOTES																					
1. CONNECT DBC TO DOOR EQUIPMENT VIA DBC INTERFACE TERMINATION BOX PROVIDED UNDER PROJECT #59016. REFER TO DETAILS ON SHEET E503 FOR ADDITIONAL INFORMATION.																					
2. NOT USED.																					
3. REPLACE EXISTING VON DUPRIN "CHEXIT" DEVICE WITH VON DUPRIN DE5101 DELAYED EGRESS SYSTEM AS NOTED ON DRAWINGS (FLOOR PLANS & DETAILS ON SHEET E504) AND IN SPECIFICATION SECTION 13710.																					
4. PROVIDE CARD READERS FOR ENABLE CONTROL OF OVERHEAD DOOR. REFER TO SHEET E211 AND SPECIFICATION SECTION 13710 FOR ADDITIONAL INFORMATION.																					
5. PROVIDE ACCESS CONTROL OF DOOR SG121. REFER TO SHEETS E201, E504 & E613 AND SPECIFICATION SECTION 13710 FOR ADDITIONAL INFORMATION.																					
6. REPLACE EXISTING SURFACE MOUNTED RACEWAY WITH CONCEALED CONDUIT IAW SECURITY DOOR DETAILS.																					
7. CONNECT TO PANIC/DURESS SWITCHES AT TSA SCREENING LOCATIONS VIA CONDUIT PROVIDED BETWEEN PANIC/DURESS SWITCH AND DBC LOCATION UNDER PROJECT No. 59016.																					
8. CONNECT TO TSA EMPLOYEE VALIDATION CARD READER VIA CONDUIT PROVIDED BETWEEN CARD READER AND DBC LOCATION UNDER PROJECT No. 59016.																					
9. CONNECT TO SCREENING ROLLUP DOOR ENABLE CARD READER VIA CONDUIT PROVIDED BETWEEN CARD READER AND DBC LOCATION UNDER PROJECT No. 59016.																					
10. GENERAL NOTE: REUSE EXISTING IDC POWER CIRCUITS FOR DBCs WHERE NOTED. PROVIDE NEW POWER CIRCUITS FOR DBCs WHERE NOTED. DEMOLISH EXISTING CIRCUITS WHERE NEW CIRCUITS ARE PROVIDED. FIELD VERIFY ALL EXISTING AND NEW CIRCUITS PRIOR TO CUTOVER FROM EXISTING IDC TO DBC.																					
11. GENERAL NOTE: REFER TO DETAILS ON SHEET E502 FOR ADDITIONAL INFORMATION ON SOUTH TERMINAL CONCOURSE A & B AND MAIN TERMINAL DOORS NOT AFFECTED BY PROJECT No. 59016.																					
12. CONNECT EXISTING FIRE ALARM RELAY MODULE TO DOOR TO UNLOCK DOOR IAW SPECIFICATION SECTION 13710 AND DETAILS ON SHEET E502 OR E504 AS APPROPRIATE.																					
13. PROVIDE FIRE ALARM RELAY MODULE AND CONNECT TO DOOR TO UNLOCK DOOR IAW SPECIFICATION SECTION 13710 AND DETAILS ON SHEETS E502 OR E504 AS APPROPRIATE.																					

## **South Terminal Concourse C**

## ACS DOOR SCHEDULE

NO.	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DISC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDC/RIM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
1	C0172 (SMA029)	E301	E601	10	1	1	1	1-1	ST-C	0	CS & CF LEVEL 0	ATU-17	1	Y	N	N	N	N	N	
2	C0090 (C2005A)	E301	MDF-07	11	2	1	18	0-18	ST-C	0	CC3 & CCF	70SPB-42	1	Y	N	N	Y	N	N	MAIN TELECOM RM T01
3	C0134 (C1001A)	E301	MDF-06	11	2	1	17	0-17	ST-C	0	CC4 & CCE	70SPB-42	1	Y	N	N	Y	N	N	
4	C0147 (C1001C)	E301	MDF-01	11	2	1	15	0-15	ST-C	0	CC5 & CF	70SPA-1	1	Y	N	N	Y	N	Y	
5	C0163 (C1002A)	E301	MDF-05	11	2	1	16	0-16	ST-C	0	CC5 & CCE	70SPA-1	1	Y	N	N	Y	N	Y	
6	C0195 (C3001A)	E301	MDF-02	11	2	1	13	0-13	ST-C	0	C1 & CF	70SPA-1	1	Y	N	N	Y	N	N	
7	C0186 (C2009A)	E301	MDF-04	11	2	1	14	0-14	ST-C	0	CC6 & CG	70SPA-1	1	Y	N	N	Y	N	N	
8	C0213 (C4007A)	E301	MDF-03	11	2	1	7	0-07	ST-C	0	C1 & CG	70SPA-3	1	Y	N	N	Y	N	N	
9	C0214 (C4009A)	E301	MDF-03	11	2	1	7	0-07	ST-C	0	C1 & CG	70SPA-3	1	Y	N	N	Y	N	N	
10	C0461 (C0007A)	E301	T02-1	11	2	1	9	0-09	ST-C	0	CS & CF	70SPC-2	1	Y	N	N	Y	N	N	
11	C0446 (C0006A)	E301	T02-1	11	2	1	9	0-09	ST-C	0	CS & CF	70SPC-2	1	Y	N	N	Y	N	N	
12	C0516A (C0010A)	E301	T02-3	11	2	1	11	0-11	ST-C	0	CS & CF	70SPC-2	1	Y	N	N	Y	N	N	TELECOM RM T02
13	C0516B (C0009A)	E301	T02-3	11	2	1	11	0-11	ST-C	0	LEVEL 0 CS & CF	70SPC-2	1	Y	N	N	Y	N	N	
14	CL57 (C0E001 L1)	E301	T02-3	11	2	1	11	0-11	ST-C	1	LEVEL 0 CS & CF	70SPC-2	1	N	N	N	N	N	N	ELEVATOR LEVEL 1 LOBBY CARD READER
15	CL57 (C0E001 C1)	E301	T02-3	11	2	1	11	0-11	ST-C	0 AND 1	CS & CF	70SPC-2	1	N	N	N	N	N	N	ELEVATOR CAB CARD READER
16	C0516 (C0006A)	E301	T02-2	11	2	1	10	0-10	ST-C	0	CS & CF	70SPC-2	1	Y	N	N	Y	N	N	
17	C0511 (C0002A)	E301	T02-2	11	2	1	10	0-10	ST-C	0	CS & CF	70SPC-2	1	Y	N	N	Y	N	N	
18	C0029 (C4005A)	E301	N/A	11	2	1	6	0-06	ST-C	0	C1 & CG 5	70SPA-3	0	N	N	N	N	N	N	DEMOLISH IDC DOOR REMOVED FROM ACS
19	C0178 (C2019A)	E301	MDF-11	11	2	1	4	0-04	ST-C	0	C1 & CI	70SPD-4	1	Y	N	N	Y	N	N	
20	C0175 (C2028A)	E301	MDF-11	11	2	1	4	0-04	ST-C	0	C1 & CI	70SPD-4	1	Y	N	N	Y	N	N	
21	C0072B (C2010A)	E301	MDF-10	11	2	1	3	0-03	ST-C	0	LEVEL 0 CH & M2	70SPF-4	1	Y	N	N	Y	N	N	
22	S0617 (C2016A)	E301	MDF-08	11	2	1	2	0-02	ST-C	0	CC3 & CH	70SPB-42	2	N	N	N	Y	N	N	
23	C0072 (C2006A)	E301	MDF-09	11	2	1	1	0-01	ST-C	0	CC2 & CH	70SPB-42	1	Y	N	N	Y	N	N	
24	C1201 (C4104A)	E311	T07-03	11	2	2	17	1-51	ST-C	1	C1 & CF	71SPA-39	1	Y	N	N	Y	N	Y	NOTE 6
25	C1203 (C4101B)	E311	T07-03	11	2	2	17	1-51	ST-C	1	C1 & CF	71SPA-39	2	N	N	N	Y	N	N	
26	OVERSIZE BAGGAGE	E311	T07-03	--	--	--	--	--	ST-C	1	C1 & CF	71SPA-39	1	N	N	N	N	N	N	NOTE 1 OVERSIZE BAGGAGE OHD AT ALASKA AIRLINES BAG CLAIM
27	C1373 (C3107A)	E311	T07-02	11	2	2	15	1-33	ST-C	1	C7 & CF	71SPR-5	2	N	N	N	Y	N	N	
28	C1371 (C4104B)	E311	T07-02	11	2	2	15	1-33	ST-C	1	C7 & CF	71SPR-5	1	Y	N	N	Y	N	N	
29	S2679 (C4217A)	E321	T07-01	11	2	2	14	1-31	ST-C	2	LEVEL 1 C1 & CI	71SPD-42	1	Y	N	N	Y	N	N	
30	S1677 (C4S101A)	E311	T07-01	11	2	2	14	1-31	ST-C	1	LEVEL 1 C1 & CI	71SPD-42	1	Y	N	N	Y	N	Y	NOTE 6
31	FSDICS-01	E311	T07-01	11	2	2	14	1-31	ST-C	1 & 2	LEVEL 1 C1 & CI	71SPD-42	1	N	N	N	N	N	N	CURBSIDE CHECK-IN BAGBELT
32	C1169 (C1107C)	E311	T03-01	11	2	2	13	1-13	ST-C	1	CC5 & CB	71SPA-41	1	Y	N	N	Y	N	Y	
33	C1128 (C1111B)	E311	T03-10	11	2	2	10	1-10	ST-C	1	CC4 & CE5	71SPB-4	1	Y	N	N	Y	N	N	
34	C1129 (C1112A)	E311	T03-10	11	2	2	10	1-10	ST-C	1	CC4 & CE5	71SPB-4	1	Y	N	N	Y	N	N	

ACS DOOR SCHEDULE

NO. (OLD DOOR NO.)	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DRG (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDCRIM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
35	C1155 (C1144A)	E311	T03-11	11	2	2	11	1-11	ST-C	1	CC5 & CE5	71SPA-39	1	Y	N	N	Y	N	N	
36	C1155 (C1144C)	E311	T03-11	11	2	2	11	1-11	ST-C	1	CC5 & CE5	71SPA-39	1	Y	N	N	Y	N	N	
37	C1163 (C1107E)	E311	T03-09	11	2	2	9	1-09	ST-C	1	CC5 & CCD	71SPA-41	1	Y	N	N	Y	N	Y	
38	C1165 (C1123A)	E311	T03-09	11	2	2	9	1-09	ST-C	1	CC5 & CCD	71SPA-41	1	Y	N	N	Y	N	N	
39	C1160 (C1109A)	E311	T03-09	11	2	2	9	1-09	ST-C	1	CC5 & CCD	71SPA-41	1	Y	N	N	Y	N	N	
40	CL11 CAB (C1EV02)	E311	T03-08	11	2	2	8	1-08	ST-C	1	LEVEL 1 CC5 & CCB	71SPA-41	1	N	N	N	N	N	N	ELEVATOR CAB CARD READER
41	CL11 LEVEL 1 LOBBY (C1EV02)	E311	T03-08	11	2	2	8	1-08	ST-C	1	CC5 & CCB	71SPA-41	1	N	N	N	N	N	N	ELEVATOR LEVEL 1 LOBBY CARD READER
42	C1141 (C1104A)	E311	T03-08	11	2	2	8	1-08	ST-C	1	LEVEL 1 CC5 & CCB	71SPA-41	1	Y	N	N	Y	N	N	
43	TRANSFER BELT TB-01	E311	T03-08	11	2	2	8	1-08	ST-C	1	LEVEL 1 CC5 & CCB	71SPA-41	1	Y	N	N	N	N	N	
43	C1051B1 (C1135A)	E311	T03-07	11	2	2	7	1-07	ST-C	1	CC1 & CCD	71SPB-2	1	N	N	N	N	N	N	
44	C1051A1	E311	T03-07	11	2	2	7	1-07	ST-C	1	CC1 & CCD	71SPB-2	1	Y	N	N	Y	N	N	
45	C1051F (C1101A)	E311	T03-06	11	2	2	6	1-06	ST-C	1	CC2 & CCC	71SPB-2	1	Y	N	N	Y	N	N	
46	C1060 (C1129A)	E311	T03-05	11	2	2	5	1-05	ST-C	1	CC1 & CCA	71SPB-2	1	Y	N	N	Y	N	N	
47	C1061A (C1120B)	E311	T03-05	11	2	2	5	1-05	ST-C	1	CC1 & CCA	71SPB-2	1	Y	N	N	N	N	N	
48	C1061 (C1121A)	E311	T03-05	11	2	2	5	1-05	ST-C	1	CC1 & CCA	71SPB-2	1	Y	N	N	Y	N	Y	
49	C1045 (C1133A)	E311	T03-04	11	2	2	4	1-04	ST-C	1	CC1 & CCD	71SPB-4	1	Y	N	N	Y	N	N	
50	C1044A (C1134A)	E311	T03-04	11	2	2	4	1-04	ST-C	1	CC1 & CCD	71SPB-4	1	Y	N	N	Y	N	N	
51	C1044 (C1S1021A)	E311	T03-04	11	2	2	4	1-04	ST-C	1	CC1 & CCD	71SPB-4	2	N	N	N	Y	N	N	
52	C1038 (C1110A)	E311 E604	T03-03	11	2	2	3	1-03	ST-C	1	CC1 & CE5	71SPB-4	1	Y	N	N	Y	N	N	TELECOM RM T03
53	C1039A (C1103A)	E311 E604	T03-03	11	2	2	3	1-03	ST-C	1	CC1 & CE5	71SPB-4	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM TE03
54	C1040 (C1111A)	E311	T03-02	11	2	2	2	1-02	ST-C	1	CC2 & CE5	71SPB-4	1	Y	N	N	Y	N	N	
55	C1569A1 (C5107A)	E311 E604	T04-10	11	2	3	24	1-68	ST-C	1	C12 & CB1	71SPB-2	1	Y	N	N	Y	N	N	TELECOM RM T04
56	C1569A (C5106A)	E311 E604	T04-10	11	2	3	24	1-68	ST-C	1	C12 & CB1	71SPB-2	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM TE04
57	C1569 (C5117A)	E311	T04-11	11	2	3	25	1-69	ST-C	1	C12 & CB1	71SPB-2	1	Y	N	N	Y	N	N	
58	C1657 (C7S1021A)	E312	T04-12	11	2	3	22	1-66	ST-C	1	C16 & CB	81SPA-2	2	N	Y	Y	Y	Y	Y	NOTE 4
59	C1719 (C7S1031A)	E312	T05-02	11	2	3	21	1-65	ST-C	1	C18 & CB	81SPA-4	2	N	Y	Y	Y	Y	Y	NOTE 4
60	C1715 (C1100A)	E312	T05-03	11	2	3	20	1-64	ST-C	1	C19 & CB	81SPA-4	1	Y	N	N	N	N	N	
61	C1693B (C7EV01)	E312	T05-03	11	2	3	20	1-64	ST-C	1	C19 & CB	81SPA-4	2	N	N	N	Y	N	N	CARD READER WITH INTEGRAL KEYPAD. NOTE 5.
62	CL78 B1 (C7EV01)	E312	T05-04	11	2	3	19	1-63	ST-C	1	C19 & CB1	81SPA-4	1	N	N	N	N	N	N	ELEVATOR CAB CARD READER
63	CL78 B2 (C7EV01)	E312	T05-04	11	2	3	19	1-63	ST-C	1	C19 & CB1	81SPA-4	0	N	N	N	N	N	N	
64	CL78 B3 (C7EV01)	E312	T05-04	11	2	3	19	1-63	ST-C	1	C19 & CB1	81SPA-4	0	N	N	N	N	N	N	
65	CL78 B4 (C7EV01)	E312	T05-04	11	2	3	19	1-63	ST-C	1	C19 & CB1	81SPA-4	0	N	N	N	N	N	N	
66	C1713 (C1104A)	E312	T05-04	11	2	3	18	1-63	ST-C	1	C19 & CB1	81SPA-4	1	Y	N	N	Y	N	N	

## ACS DOOR SCHEDULE

NO.	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DRG (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDCRIM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
67	CL78 L2 (C7E/V01)	E321	T05-04	11	2	3	18	1-63	ST-C	1	C19 & CB1	81SPA-4	1	N	N	N	N	N	N	ELEVATOR LEVEL 2 LOBBY CARD READER
68	CL78 L3 (C7E/V01)	E331	T05-04	11	2	3	18	1-63	ST-C	1	C19 & CB1	81SPA-4	1	N	N	N	N	N	N	ELEVATOR LEVEL 3 LOBBY CARD READER
69	CL71 L1 (C7100A)	E312	T05-01	11	2	3	16	1-61	ST-C	1	C18 & CC	81SPA-4	1	Y	N	N	Y	N	N	
70	CL71 L0 (C7100A)	E312	T05-01	11	2	3	16	1-61	ST-C	1	C18 & CC	81SPA-4	1	Y	N	N	Y	N	N	
71	CL70S (C7110A)	E312	T05-05	11	2	3	17	1-62	ST-C	1	C19 & CC-4	81SPA-2	2	N	N	N	Y	N	N	CARD READER WITH INTEGRAL KEYPAD NOTE 5
72	CL679 (C7101E)	E312	T04-15	11	2	3	15	1-60B	ST-C	1	C18 & CC-4	81SPA-2	2	N	N	N	Y	N	N	CARD READER WITH INTEGRAL KEYPAD NOTE 5
73	CL681 (C7101C)	E312	T04-14	11	2	3	13	1-60	ST-C	1	C18 & CC-4	81SPA-2	2	N	N	N	Y	N	N	
74	CL603 (C7101A)	E312	T04-13	11	2	3	11	1-59	ST-C	1	C14 & CC-4	71SP-2	1	Y	N	N	Y	N	N	CARD READER WITH INTEGRAL KEYPAD NOTE 6
75	CL596 (C6S1021A)	E311	T04-09	11	2	3	10	1-58	ST-C	1	C13 & CC-4	71SPQ-1	1	Y	N	N	Y	N	Y	
76	CL553 (C6S1021B)	E311	T04-09	11	2	3	10	1-58	ST-C	1	C13 & CC-4	71SPQ-1	1	Y	N	N	Y	N	Y	
77	CL529 (C6101E)	E311	T04-08	11	2	3	9	1-57	ST-C	1	C12 & CC-9	71SPQ-3	1	Y	N	N	Y	N	Y	NOTE 6
78	CL528 (C6S1011B)	E311	T04-07	11	2	3	8	1-56	ST-C	1	C12 & CC-9	71SPQ-3	1	Y	N	N	Y	N	Y	NOTE 6
79	CL530 (C6S1011A)	E311	T04-07	11	2	3	8	1-56	ST-C	1	C12 & CC-9	71SPQ-3	2	N	N	N	Y	N	N	
80	CL532 (C6101A)	E311	T04-06	11	2	3	7	1-54A	ST-C	1	C11 & CE	71SPQ-1	2	N	N	N	Y	N	N	
81	CL504 (C6101F)	E311	T04-06	11	2	3	7	1-54A	ST-C	1	C11 & CE	71SPQ-1	0	N	N	N	Y	N	N	ROOF HATCH BMS ONLY
82	CL533 (C5101A)	E311	T04-05	11	2	3	6	1-54	ST-C	1	C11 & CC-4	71SPQ-1	2	N	N	N	Y	N	N	
83	CL507 (C6S1031A)	E311	T04-05	11	2	3	6	1-54	ST-C	1	C11 & CC-4	71SPQ-1	2	N	N	N	Y	N	Y	NOTE 5
84	CL407 (C6S1021B)	E311	T04-01	11	2	3	1	1-34	ST-C	1	C7 & CE	71SPR-5	2	N	N	N	Y	N	N	
85	CL463D (C5103A)	E311	T04-02	11	2	3	2	1-35	ST-C	1	C8 & CB	71SPN-5	1	Y	N	N	Y	N	N	
86	CL463C (C5105A)	E311	T04-02	11	2	3	2	1-35	ST-C	1	C8 & CB	71SPN-5	1	Y	N	N	Y	N	N	
87	CL56 L2 (C5E/V01)	E311	T04-03	11	2	3	3	1-36	ST-C	1	C9 & CB1	71SPN-5	1	N	N	N	N	N	N	ELEVATOR LEVEL 2 LOBBY CARD READER
88	CL56 L3 (C5E/V01)	E321	T04-03	11	2	3	3	1-36	ST-C	1	C9 & CB1	71SPN-5	1	N	N	N	N	N	N	ELEVATOR LEVEL 3 LOBBY CARD READER
89	CL465 (C5S1011A)	E311	T04-03	11	2	3	3	1-36	ST-C	1	C9 & CB1	71SPN-5	2	N	Y	Y	Y	Y	Y	NOTE 4
90	CL463A (C5104A)	E311	T04-03	11	2	3	3	1-36	ST-C	1	C9 & CB1	71SPN-5	1	Y	N	N	Y	N	N	
91	CL519 (C5114A)	E311	T04-04	11	2	3	4	1-37	ST-C	1	C10 & CB	71SPN-5	1	Y	N	N	Y	N	N	
92	CL795 (C6104A)	E312	T05-13	11	2	4	19	1-69	ST-C	1	C22 & CB	81SPA-8	1	Y	N	N	Y	N	N	
93	CL611A (C6106A)	E312 E605	T05-12	11	2	4	18	1-68	ST-C	1	C22 & CC	81SPA-8	1	Y	N	N	Y	N	N	TELECOM RM T05
94	CL811 (C6105A)	E312 E605	T05-12	11	2	4	18	1-68	ST-C	1	C22 & CC	81SPA-8	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM T05
95	CL618 (C6S1011A)	E312	T05-14	11	2	4	17	1-67	ST-C	1	C23 & CB	81SPA-8	2	N	Y	Y	Y	Y	Y	NOTE 4
96	CL919B (C9104A)	E312	T06-08	11	2	4	16	1-64	ST-C	1	C23 & CB	81SPA-8	1	Y	N	N	Y	N	N	
97	CL919A (C9106A)	E312 E605	T06-08	11	2	4	16	1-64	ST-C	1	C23 & CB	81SPA-8	1	Y	N	N	Y	N	N	TELECOM RM T06
98	CL919 (C9105A)	E312 E605	T06-07	11	2	4	15	1-63	ST-C	1	C27 & CB	81SP-2	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM T06
99	CL920 (C9S1011A)	E312	T06-07	11	2	4	15	1-63	ST-C	1	C27 & CB	81SP-2	2	N	Y	Y	Y	Y	Y	NOTE 4
100	CL994 (C9S1021A)	E312	T06-06	11	2	4	14	1-62	ST-C	1	C29 & CB	81SP-2	2	N	Y	Y	Y	Y	Y	NOTE 4

ACS DOOR SCHEDULE

NO.	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	DCRIM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
101	CL96 L2 (C9E01)	E321	T06-05	11	2	4	13	1-78	ST-C	2	LEVEL 1 C30 & CB 1	81SPP-4	1	N	N	N	N	N	N	ELEVATOR LEVEL 2 LOBBY CARD READER
102	CL96 L3 (C9E01)	E331	T06-05	11	2	4	13	1-78	ST-C	3	LEVEL 1 C30 & CB 1	81SPP-4	1	N	N	N	N	N	N	ELEVATOR LEVEL 3 LOBBY CARD READER
103	CL96 B1 (C9E01)	E312	T06-05	11	2	4	12	1-78	ST-C	1	LEVEL 1 C30 & CB 1	81SPP-4	1	N	N	N	N	N	N	ELEVATOR CAB CARD READER
104	CL96 B2 (C9E01)	E312	T06-05	11	2	4	12	1-78	ST-C	1	LEVEL 1 C30 & CB 1	81SPP-4	0	N	N	N	N	N	N	
105	CL96 B3 (C9E01)	E312	T06-05	11	2	4	12	1-78	ST-C	1	LEVEL 1 C30 & CB 1	81SPP-4	0	N	N	N	N	N	N	
106	CL96 B4 (C9E01)	E312	T06-05	11	2	4	12	1-78	ST-C	1	LEVEL 1 C30 & CB 1	81SPP-4	0	N	N	N	N	N	N	
107	C1990 (C9109A)	E312	T06-04	11	2	4	11	1-81	ST-C	1	C30 & CB 1	81SPP-4	1	Y	N	N	Y	N	N	
108	C1986 (C91031A)	E312	T06-03	11	2	4	10	1-80	ST-C	1	C30 & CC	81SPP-4	2	N	Y	Y	Y	Y	Y	NOTE 4
109	C1983 (C9109A)	E312	T06-03	11	2	4	10	1-80	ST-C	1	C30 & CC	81SPP-4	1	Y	N	N	Y	N	N	
110	C1982 (C9107A)	E312	T06-03	11	2	4	10	1-80	ST-C	1	C30 & CC	81SPP-4	2	N	N	N	Y	N	N	
111	C1977 (C9102A)	E312	T06-02	11	2	4	9	1-79	ST-C	1	C30 & CD	81SPA-5	1	Y	N	N	Y	N	Y	NOTE 6
112	C1879 (C9103B)	E312	T06-01	11	2	4	8	1-76	ST-C	1	C26 & CD	81SPA-5	2	N	N	N	Y	N	Y	NOTE 5
113	C1801 (C9112B)	E312	T05-10	11	2	4	6	1-74	ST-C	1	C22 & CD	81SPA-5	0	N	N	N	N	N	N	ROOF HATCH BMS ONLY
114	C1804 (C9112A)	E312	T05-10	11	2	4	6	1-74	ST-C	1	C22 & CD	81SPA-5	1	Y	N	N	Y	N	Y	
115	C1780 (C9110A)	E312	T05-09	11	2	4	5	1-73	ST-C	1	C22 & CD	81SPA-5	2	N	N	N	Y	N	N	
116	C1754 (C9101C)	E312	T05-08	11	2	4	4	1-72A	ST-C	1	C20 & CC-4	81SPA-5	2	N	N	N	Y	N	Y	NOTE 5
117	C1728 (C9101B)	E312	T05-07	11	2	4	3	1-72	ST-C	1	C20 & CC-4	81SPA-5	1	Y	N	N	Y	N	N	
118	C1728 (C9101A)	E312	T05-06	11	2	4	2	1-71A	ST-C	1	C19 & CD	81SPA-2	1	Y	N	N	Y	N	N	
119	C1703 (C75T041A)	E312	T05-11	11	2	4	1	1-71	ST-C	1	C19 & CD	81SPA-2	1	Y	N	N	Y	N	Y	NOTE 6
120	C2070 (C1SE02A)	E321	T07-04	12	3	1	15	2-15	ST-C	2	C5 & CF	72SPA-4	0	N	N	N	N	N	N	SECURITY SCREENING OHD BMS ONLY
121	S2167 (C2127) (C1SE03A)	E321	T07-04	12	3	1	15	2-15	ST-C	2	C5 & CF	72SPA-4	0	N	N	N	N	N	N	SECURITY SCREENING OHD BMS ONLY
122	C2096 (C1SE01A)	E321	T07-04	12	3	1	16	2-16	ST-C	2	C5 & CF	72SPA-4	0	N	N	N	N	N	N	SECURITY SCREENING OHD BMS ONLY
123	S2647 (C2204A)	E321	T07-04	12	3	1	15	2-15	ST-C	2	C5 & CF	72SPA-4	1	Y	N	N	Y	N	N	
124	C2153 (C210A)	E321	T07-13	12	3	1	9	2-09	ST-C	2	C6 & CF	72SPA-2	1	Y	N	N	Y	N	N	
125	C2191 (C201A)	E321	T07-13	12	3	1	9	2-09	ST-C	2	C6 & CF	72SPA-2	2	N	N	N	Y	N	N	
126	C2204A (C221A)	E321 E606	T07-12	12	3	1	7	2-07	ST-C	2	C2 & CE 5	72SPA-2	1	Y	N	N	Y	N	N	TELECOM RM T07
127	C2204 (C222A)	E321 E606	T07-12	12	3	1	7	2-07	ST-C	2	C2 & CE 5	72SPA-2	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM T07
128	S2722 (C4202A)	E321	T07-11	12	3	1	8	2-08	ST-C	2	C2 & CF	72SPA-2	1	Y	N	N	Y	N	Y	NOTE 6
129	C2203 (C222A)	E321	T07-11	12	3	1	8	2-08	ST-C	2	C2 & CF	72SPA-2	1	Y	N	N	Y	N	N	
130	C2305 (C212A)	E321	T07-14	12	3	1	6	2-06	ST-C	2	C4 & CE	72SPA-4	1	Y	N	N	Y	N	N	
131	C2403	E321	T07-14	12	3	1	6	2-06	ST-C	2	C4 & CE	72SPA-4	2	N	N	N	Y	N	Y	NOTE 5
132	C2264 (C3203A)	E321	T06-02	12	3	1	14	2-14	ST-C	2	C3 & CB 1	72SPA-4	1	Y	N	N	Y	N	N	
133	(C35ST012A)	E321	T06-03	12	3	1	13	2-13	ST-C	2	C6 & CA	72SPA-1	2	N	Y	Y	Y	Y	Y	NOTE 4



ACS DOOR SCHEDULE

NO.	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC. (E)	PRIMARY ACC. (E)	LOOP NO. (E)	IDC/IM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
134	C2665 GATE C1 (C3025A)	E321	T06-04	12	3	1	12	2-12	ST-C	2	C6 & CA	73SPA-1	1	Y	N	N	Y	N	N	
135	DUMBWATER GATE C1	E321	T06-04	12	3	1	12	2-12	ST-C	2	C6 & CA	73SPA-1	1	N	N	N	Y	N	N	
136	C2665 GATE C2 (C3026A)	E321	T04-18	12	3	1	11	2-11	ST-C	2	C9 & CA	73SPA-3	1	Y	N	N	Y	N	N	
137	DUMBWATER GATE C2	E321	T04-18	12	3	1	11	2-11	ST-C	2	C9 & CA	73SPA-3	1	N	N	N	Y	N	N	
138	C2642 (C3211A)	E321	T04-19	12	3	1	10	2-10	ST-C	2	C9 & CB	73SPA-3	1	Y	N	N	Y	N	N	
139	C2663 (C351012A)	E321	T04-19	12	3	1	10	2-10	ST-C	2	C9 & CB	73SPA-3	2	N	Y	Y	Y	Y	Y	NOTE 4
140	S2722G (10106A)	E321	T07-09	12	3	1	5	2-05	ST-C	2	C5 & CG	72SPA-6	1	Y	N	N	Y	N	Y	NOTE 6
141	O89-02	E321	T07-09	12	3	1	5	2-05	ST-C	2	C5 & CG	72SPA-6	1	N	N	N	N	N	N	AMERICAN AIRLINES OUTBOUND BAGBELT
142	S2667 (C4206A)	E321	T07-06	12	3	1	5	2-05	ST-C	2	C5 & CG	72SPA-6	0	N	N	N	N	N	N	ACCESS DOOR, BMS ONLY
143	O87-02	E321	T07-06	12	3	1	4	2-04	ST-C	2	C4 & CG	72SPA-6	1	N	N	N	N	N	N	ALASKA AIRLINES NORTH OUTBOUND BAGBELT
144	S2767 (10112A)	E321	T07-06	12	3	1	4	2-04	ST-C	2	C4 & CG	72SPA-6	1	Y	N	N	Y	N	N	
145	O84-02	E321	T07-07	12	3	1	3	2-03	ST-C	2	C1 & CG	72SPA-6	1	N	N	N	N	N	N	ALASKA AIRLINES CENTER OUTBOUND BAGBELT
146	O85-02	E321	T07-07	12	3	1	3	2-03	ST-C	2	C1 & CG	72SPA-6	1	N	N	N	N	N	N	ALASKA AIRLINES TICKET COUNTER BAGBELT
147	O81-01	E321	T07-06	12	3	1	2	2-02	ST-C	2	C1 & CG	72SPA-6	1	N	N	N	N	N	N	ALASKA AIRLINES OVERSIZE BAGBELT
148	O82-02	E321	T07-06	12	3	1	2	2-02	ST-C	2	C1 & CG	72SPA-6	1	N	N	N	N	N	N	ALASKA AIRLINES SOUTH OUTBOUND BAGBELT
149	C2176B (C4203B)	E321	T07-05	12	3	1	1	2-01	ST-C	2	C1 & CG	72SPA-2	0	N	N	N	N	N	N	ROOF HATCH, BMS ONLY
150	C2176 (C4203A)	E321	T07-05	12	3	1	1	2-01	ST-C	2	C1 & CG	72SPA-2	1	Y	N	N	Y	N	N	
151	S2666 (C4201B)	E321	T07-05	12	3	1	1	2-01	ST-C	2	C1 & CG	72SPA-2	2	N	N	N	Y	N	Y	NOTE 5
152	C2663 (C5207A)	E321	T04-13	12	3	2	19	2-53	ST-C	2	C12 & CB.1	73SPA-5	1	Y	N	N	Y	N	N	
153	C2692 (C751012A)	E322	T04-14	12	3	2	18	2-52	ST-C	2	C13 & CB	73SPA-5	2	N	Y	Y	Y	Y	Y	NOTE 4
154	C2694 GATE C3 (C7204A)	E322	T04-15	12	3	2	17	2-51	ST-C	2	C13 & CA	73SPA-5	1	Y	N	N	Y	N	N	
155	DUMBWATER GATE C3	E322	T04-15	12	3	2	17	2-51	ST-C	2	C13 & CA	73SPA-5	1	N	N	N	Y	N	N	
156	C2689 GATE C4 (C7202A)	E322	T04-17	12	3	2	16	2-50	ST-C	2	C16 & CA	83SPA-1	1	Y	N	N	Y	N	N	
157	DUMBWATER GATE C4	E322	T04-17	12	3	2	16	2-50	ST-C	2	C16 & CA	83SPA-1	1	N	N	N	Y	N	N	
158	C2667 (C751022A)	E322	T04-16	12	3	2	15	2-49	ST-C	2	C16 & CB	83SPA-1	2	N	Y	Y	Y	Y	Y	NOTE 4
159	C2721 GATE C5 (C7203A)	E322	T05-15	12	3	2	13	2-47	ST-C	2	C19 & CA	83SPA-3	1	Y	N	N	Y	N	N	
160	DUMBWATER GATE C5	E322	T05-15	12	3	2	13	2-47	ST-C	2	C19 & CA	83SPA-3	1	N	N	N	Y	N	N	
161	C2719 (C751032A)	E322	T05-16	12	3	2	12	2-46	ST-C	2	C18 & CB	83SPA-3	2	N	Y	Y	Y	Y	Y	NOTE 4
162	C2780 (C5206A)	E322	T05-17	12	3	2	14	2-31	ST-C	2	C20 & CC	83SPA-5	1	Y	N	N	Y	N	N	
163	C2785 (C6209A)	E322	T05-17	12	3	2	14	2-31	ST-C	2	C20 & CC	83SPA-5	1	Y	N	N	Y	N	N	
164	C2819 GATE C6 (C5211A)	E322	T05-19	12	3	2	10	2-44	ST-C	2	C23 & CA	83SPA-7	1	Y	N	N	Y	N	N	

ACS DOOR SCHEDULE

NO.	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDCRIM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
165	DUMBWATER GATE C6 C817 (C81012A)	E322	T05-19	12	3	2	10	2-44	ST-C	2	C23 & CA	83SPA-7	1	N	N	N	Y	N	N	NOTE 4
166		E322	T05-18	12	3	2	11	2-45	ST-C	2	C23 & CB	83SPA-7	2	N	Y		Y	Y	Y	
167	C819 GATE C7 (C8202A)	E322	T06-16	12	3	2	8	2-42	ST-C	2	C27 & CA	81SPP-6	1	Y	N	N	Y	N	N	
168	DUMBWATER GATE C7	E322	T06-16	12	3	2	8	2-42	ST-C	2	C27 & CA	81SPP-6	1	N	N	N	Y	N	N	
169	C817 (C81012A)	E322	T06-09	12	3	2	9	2-43	ST-C	2	C27 & CB	81SPP-6	2	N	Y	Y	Y	Y	Y	NOTE 4
170	C891 (C8205A)	E322	T06-12	12	3	2	4	2-39	ST-C	2	C29 & CB	81SPP-8	1	Y	N	N	Y	N	N	
171	DUMBWATER GATE C8	E322	T06-12	12	3	2	4	2-39	ST-C	2	C29 & CB	81SPP-8	1	N	N	N	Y	N	N	
172	C894 (C81022A)	E322	T06-10	12	3	2	6	2-40	ST-C	2	C29 & CB	81SPP-8	2	N	Y	Y	Y	Y	Y	NOTE 4
173	C896 GATE C8 (C8203A)	E322	T06-11	12	3	2	7	2-41	ST-C	2	C29 & CA	81SPP-8	1	Y	N	N	Y	N	N	
174	C898 (C8206A)	E322	T06-13	12	3	2	5	2-38	ST-C	2	C30 & CB1	81SPP-10	1	Y	N	N	Y	N	N	
175	C896 (C81022A)	E322	T06-15	12	3	2	2	2-37	ST-C	2	C30 & CC	81SPP-10	2	N	Y	Y	Y	Y	Y	NOTE 4
176	C864 GATE C9 (C8204A)	E322	T06-14	12	3	2	1	2-36	ST-C	2	C30 & CC	81SPP-10	1	Y	N	N	Y	N	N	
177	DUMBWATER GATE C9	E322	T06-14	12	3	2	1	2-36	ST-C	2	C30 & CC	81SPP-10	1	N	N	N	Y	N	N	
178	C896 (C81033B)	E332	T10-08	12	3	3	5	3-05	ST-C	3	C30 & CC	83SPA-15	1	Y	N	N	Y	N	Y	NOTE 6
179	C896 (C81033A)	E332	T10-08	12	3	3	5	3-05	ST-C	3	C30 & CC	83SPA-15	2	N	Y	Y	Y	Y	Y	NOTE 4
180	C880	E332	T10-08	12	3	3	6	3-06	ST-C	3	C30 & CB1	83SPA-15	2	N	N	N	Y	N	Y	NOTE 5
181	C822 (C81013B)	E332	T10-04	12	3	3	7	3-07	ST-C	3	C23 & CB	83SPA-13	2	N	Y	Y	Y	Y	Y	NOTE 4
182	C820 (C81013C)	E332	T10-04	12	3	3	7	3-07	ST-C	3	C23 & CB	83SPA-13	1	Y	N	N	Y	N	Y	NOTE 6
183	C816 (C81013A)	E332	T10-05	12	3	3	8	3-08	ST-C	3	C23 & CB	83SPA-13	2	N	Y	Y	Y	Y	Y	NOTE 4
184	C817 (C8306A)	E332	T10-06	12	3	3	9	3-09	ST-C	3	C23 & CB1	83SPA-13	1	Y	N	N	Y	N	N	
185	C811A (C8307A)	E332 E608	T10-03	12	3	3	4	3-04	ST-C	3	C22 & CB1	83SPA-13	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM T10
186	C811A1 (C8308A)	E332 E608	T10-03	12	3	3	4	3-04	ST-C	3	C22 & CB1	83SPA-13	1	Y	N	N	Y	N	N	TELECOM RM T10
187	C814	E332	T10-03	12	3	3	4	3-04	ST-C	3	C22 & CB1	83SPA-13	2	N	N	N	Y	N	Y	NOTE 5
188	C818 (C8305A)	E332	T10-02	12	3	3	10	3-10	ST-C	3	C22 & CB1	83SPA-11	1	Y	N	N	Y	N	N	
189	C814 (C7304A)	E332	T10-01	12	3	3	3	3-03	ST-C	3	C16 & CB1	83SPA-11	1	Y	N	N	Y	N	N	
190	C872 (C731023B)	E332	T09-05	12	3	3	11	3-11	ST-C	3	C16 & CA	73SPB-2	1	Y	N	N	Y	N	Y	NOTE 6
191	C869 (C731023A)	E332	T09-05	12	3	3	11	3-11	ST-C	3	C16 & CA	73SPB-2	2	N	Y	Y	Y	Y	Y	NOTE 4
192	C353A (C5306A)	E331 E607	T09-04	12	3	3	12	3-12	ST-C	3	C12 & CB1	73SPB-2	1	Y	N	N	Y	N	N	TELECOM RM T09
193	C353 (C5306A)	E331 E607	T09-04	12	3	3	12	3-12	ST-C	3	C12 & CB1	73SPB-2	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM T09
194	C353B	E331	T09-07	12	3	3	12	3-12	ST-C	3	C12 & CB1	73SPB-2	1	Y	N	N	Y	N	Y	
195	C3469 (C5304A)	E331	T09-01	12	3	3	2	3-02	ST-C	3	C8 & CC	73SPA-7	1	Y	N	N	Y	N	N	
196	C3456 (C3306A)	E331	T09-02	12	3	3	14	3-14	ST-C	3	C8 & CA	73SPA-7	2	N	N	N	Y	N	Y	NOTE 5
197	C3453 (C5303A)	E331	T08-02	12	3	3	14	3-14	ST-C	3	C8 & CA	73SPA-7	1	Y	N	N	Y	N	N	

ACS DOOR SCHEDULE

NO.	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DOOR (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDCRIM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
198	C3464 (C3312A)	E331	T09-02	12	3	3	14	3-14	ST-C	3	C8 & CA	73SPA-7	1	Y	N	N	Y	N	N	
199	C3464 (C331013B)	E331	T09-03	12	3	3	13	3-13	ST-C	3	C8 & CB.1	73SPA-7	1	Y	N	N	Y	N	Y	NOTE 6
200	C3465 (C331013A)	E331	T09-03	12	3	3	13	3-13	ST-C	3	C8 & CB.1	73SPA-7	2	N	Y	Y	Y	Y	Y	NOTE 4
201	C3466 (C33065A)	E331 E607	T08-01	12	3	3	1	3-01	ST-C	3	C3 & CC	73SPA-2	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM TE08
202	C3468A (C33064A)	E331 E607	T08-01	12	3	3	1	3-01	ST-C	3	C3 & CC	73SPA-2	1	Y	N	N	Y	N	N	TELECOM RM T08
203	C4225 (C34029A)	E341	T11-01	12	3	4	21	4-21	ST-C	4	C1 & CB	74SPB-10	2	N	N	N	Y	N	N	
204	C4324 (C3403A)	E341 E609	T11-05	12	3	4	20	4-20	ST-C	4	C3 & CB	74SPB-12	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM TE11
205	C4324A (C3405A)	E341 E609	T11-05	12	3	4	20	4-20	ST-C	4	C3 & CB	74SPB-12	1	Y	N	N	Y	N	N	TELECOM RM T11
206	C4426 (C3405B)	E341	T11-06	12	3	4	19	4-19	ST-C	4	C8 & CA	74SPA-42	2	N	N	N	Y	N	N	
207	C4422 (C3404B)	E341	T11-06	12	3	4	19	4-19	ST-C	4	C8 & CA	74SPA-42	1	Y	N	N	Y	N	Y	
208	C4453 (C3405A)	E341	T12-02	12	3	4	18	4-18	ST-C	4	C9 & CB	74SPA-42	1	Y	N	N	Y	N	Y	
209	C4481 (C351014B)	E341	T12-02	12	3	4	18	4-18	ST-C	4	C9 & CB	74SPA-42	0	N	N	N	N	N	N	ROOF HATCH, BMS ONLY
210	C4457 (C351014A)	E341	T12-02	12	3	4	18	4-18	ST-C	4	C9 & CB	74SPA-42	1	Y	N	N	Y	N	Y	NOTE 6
211	C4664 (C3404A)	E341 E609	T12-01	12	3	4	17	4-17	ST-C	4	C12 & CB	74SPA-40	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM TE12
212	C4664A (C3406A)	E341 E609	T12-01	12	3	4	17	4-17	ST-C	4	C12 & CB	74SPA-40	1	Y	N	N	Y	N	N	TELECOM RM T12
213	C4672 (C731024B)	E342	T13-01	12	3	4	16	4-16	ST-C	4	C16 & CB	84SPB-2	0	N	N	N	N	N	N	ROOF HATCH, BMS ONLY
214	C4670 (C731024A)	E342	T13-01	12	3	4	16	4-16	ST-C	4	C16 & CB	84SPB-2	1	Y	N	N	Y	N	Y	NOTE 6
215	C4645 (C7402B)	E342	T13-01	12	3	4	16	4-16	ST-C	4	C16 & CB	84SPB-2	2	N	N	N	Y	N	N	
216	C4687 (C7403A)	E342	T13-02	12	3	4	15	4-15	ST-C	4	C17 & CC	84SPB-2	2	N	N	N	Y	N	N	
217	C4706 (C7405A)	E342 E610	T13-04	12	3	4	14	4-14	ST-C	4	C18 & CC	84SPB-2	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM TE13
218	C4706A (C7406A)	E342 E610	T13-04	12	3	4	14	4-14	ST-C	4	C18 & CC	84SPB-2	1	Y	N	N	Y	N	N	TELECOM RM T13
219	C4622 (C351014C)	E342	T14-01	12	3	4	13	4-13	ST-C	4	C23 & CB	84SPC-2	0	N	N	N	N	N	N	ROOF HATCH, BMS ONLY
220	C4644 (C351014B)	E342	T14-01	12	3	4	13	4-13	ST-C	4	C23 & CB	84SPC-2	2	N	Y	Y	Y	Y	Y	NOTE 4
221	C4620 (C351014A)	E342	T14-01	12	3	4	13	4-13	ST-C	4	C23 & CB	84SPC-2	1	Y	N	N	Y	N	Y	NOTE 6
222	C4638A (C3406A)	E342 E610	T14-02	12	3	4	12	4-12	ST-C	4	C24 & CB.1	84SPC-2	1	Y	N	N	Y	N	N	TELECOM RM T14
223	C4639 (C3403A)	E342 E610	T14-02	12	3	4	12	4-12	ST-C	4	C24 & CB.1	84SPC-2	1	Y	N	N	Y	N	N	TELECOM EQUIPMENT RM TE14
224	C5665 (C351035A)	E342	T14-04	12	3	4	10	4-10	ST-C	5	LEVEL 5 & CB.1	84SPC-4	2	N	N	N	Y	N	N	
225	C4687 (C351034A)	E342	T14-03	12	3	4	9	4-09	ST-C	4	C30 & CC	84SPC-4	2	N	Y	Y	Y	Y	Y	NOTE 4
226	C4707 (C7404A)	E342	T13-03	12	3	4	7	4-07	ST-C	4	C19 & CC.4	84SPB-2	1	Y	N	N	Y	N	N	
227	C4708 (C7407B)	E342	T13-03	12	3	4	7	4-07	ST-C	4	C19 & CC.4	84SPB-2	2	N	N	N	Y	N	N	
228	C4066 (C3404C)	E341	T11-04	12	3	4	4	4-04	ST-C	4	C5 & CC.4	74SPB-12	2	N	N	N	Y	N	N	
229	C4065 (C3402B)	E341	T11-03	12	3	4	3	4-03	ST-C	4	C3 & CC	74SPB-10	2	N	N	N	Y	N	N	
230	C3468	E331	T09-06	12	3	3	15	3-15	ST-C	3	C7 & CC	73SPA-3	2	N	N	N	Y	Y	Y	NOTE 5
231	C3460A	E331	T09-06	12	3	3	15	3-15	ST-C	3	C7 & CC	73SPA-3	1	Y	N	N	Y	N	N	

ACS DOOR SCHEDULE

NO.	DOOR NO. (OLD DOOR NO.)	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDC/RM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
232	C3490	E331	T09-06	12	3	3	15	3-15	ST-C	3	C7 & CC	73SPA-3	2	N	N	N	Y	N	Y	NOTE 5
233	C3511	E331	T09-07	12	3	3	16	3-16	ST-C	3	C11 & CC	73SPA-3	2	N	N	N	Y	N	Y	NOTE 5
234	C3521	E331	T09-07	12	3	3	16	3-16	ST-C	3	C11 & CC	73SPA-3	2	N	N	N	Y	N	Y	NOTE 5
235	C3538	E332	T09-08	12	3	3	17	3-17	ST-C	3	C13 & CC	73SPB-2	2	N	N	N	Y	N	Y	NOTE 5
236	C3538C	E332	T09-08	12	3	3	17	3-17	ST-C	3	C13 & CC	73SPB-2	1	Y	N	N	Y	N	Y	
237	C3538	E332	T09-09	12	3	3	18	3-18	ST-C	3	C16 & CC	73SPB-2	2	N	N	N	Y	N	Y	NOTE 5
238	C3538	E332	T09-09	12	3	3	18	3-18	ST-C	3	C16 & CC	73SPB-2	1	Y	N	N	Y	N	Y	

NOTES

1. PROVIDE CARD READER FOR ENABLE CONTROL OF OVERHEAD DOOR. REFER TO SHEET E311 AND SPECIFICATION SECTION 13710 FOR ADDITIONAL INFORMATION.
2. GENERAL NOTE: REUSE EXISTING IDC POWER CIRCUITS FOR DBCs.
3. GENERAL NOTE: REFER TO DETAILS ON SHEET E502 FOR ADDITIONAL INFORMATION ON SOUTH TERMINAL CONCOURSE C DOOR CUTOVERS.
4. CONNECT EXISTING FIRE ALARM RELAY MODULE TO DOOR TO UNLOCK DOOR IAW SPECIFICATION SECTION 13710 AND DETAILS ON SHEET E502.
5. PROVIDE FIRE ALARM RELAY MODULE AND CONNECT TO DOOR TO UNLOCK DOOR IAW SPECIFICATION SECTION 13710 AND DETAILS ON SHEET E502.
6. EXISTING EXIT DOOR EQUIPPED WITH ELECTROMAGNETIC LOCK. REPLACE ELECTROMAGNETIC LOCK WITH ELECTRIC STRIKE. DOOR DETAILS TO BE ISSUED BY ADDENDUM.

## **Field Maintenance Facility**

ACS DOOR SCHEDULE

DOOR NO. NO.	OLD DOOR NO.	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDC/IM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	INTERCOM (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
1	AM1000	E411	T01F-06	9	0	5	7	7-5	FMF	1	K & 28	2SA-30	1	Y	N	N	N	N	Y	NOTES 5 & 6
2	AM1004	E411	T01F-06	9	0	5	5	5-5	FMF	1	S & 28	2SA-22	2	N	Y	N	Y	Y	Y	NOTE 4
3	AM37	E411	T01F-06	9	0	5	5	5-5	FMF	1	S & 28	2SA-22	1	N	N	N	N	N	N	OVERHEAD DOOR
4	AM1062	E411	T01F-05	9	0	5	4	4-5	FMF	1	T & 26	2SA-22	2	N	N	N	Y	N	N	
5	AM1090	E411	T01F-05	9	0	5	4	4-5	FMF	1	T & 26	2SA-22	2	N	Y	N	Y	Y	Y	NOTE 4
6	AM1228	E411	T01F-07	9	0	5	3	3-5	FMF	1	T & 22	2SA-20	2	N	N	N	Y	N	N	
7	AM1218	E411	T01F-10	9	0	5	2	2-5	FMF	1	P & 21	2SA-20	2	N	N	N	Y	N	N	
8	AM1268 (T01F)	E411	T01F-01	9	0	5	1	1-5	FMF	1	N & 18	2SA-20	1	Y	N	N	N	Y	N	TELECOM RM T01F NOTE 4
9	AM1272	E411	T01F-01	9	0	5	1	1-5	FMF	1	N & 18	2SA-20	2	N	N	N	Y	Y	Y	NOTE 4
10	AM1300	E411	T01F-02	9	0	5	8	8-5	FMF	1	K & 17	2SB-9	2	N	N	N	Y	Y	Y	NOTE 4
11	AM1271	E411	T01F-03	9	0	5	9	9-5	FMF	1	J & 20	2SB-9	2	N	N	N	Y	Y	Y	NOTE 4
12	AM1251	E411	T01F-09	9	0	5	11	11-5	FMF	1	E & 19	2SC-17	2	N	Y	N	Y	N	Y	NOTE 5
13	AM1275	E411	T02F-04	9	0	5	10	10-5	FMF	1	F & 18	2SB-9	2	N	Y	N	Y	Y	Y	NOTE 4
14	AM1273	E411	T01F-04	9	0	5	10	10-5	FMF	1	F & 18	2SB-9	2	N	N	N	Y	N	Y	NOTE 5
15	AM1766 (T02F)	E411	T02F-01	9	0	5	20	20-5	FMF	1	W & 5	21-47	1	Y	N	N	N	Y	N	TELECOM RM T02F NOTE 4
16	AM1330A	E411	T01F-10	--	--	--	--	--	FMF	1	--	2SA-20	N	N	N	N	--	--	N	NOTE 1
17	AM EAST GATE	E005	T01F-11	9	0	5	6	6-5	FMF	1	AT GATE	LOCAL	2	N	N	N	N	N	N	N
18	AM NORTH GATE	E005	T01F-12	9	0	5	12	12-5	FMF	1	AT GATE	LOCAL	2	N	N	N	N	N	N	N
NOTES																				
1. PROVIDE ACCESS CONTROL AT DOOR AM1330A. REFER TO SHEET E411 AND SPECIFICATION SECTION 13710 FOR ADDITIONAL INFORMATION.																				
2. GENERAL NOTE: REUSE EXISTING IDC POWER CIRCUITS FOR DBCS.																				
3. GENERAL NOTE: REFER TO DETAILS ON SHEET E502 FOR ADDITIONAL INFORMATION ON RMF DOOR CUTOVERS.																				
4. CONNECT EXISTING FIRE ALARM RELAY MODULE TO DOOR TO UNLOCK DOOR IAW SPECIFICATION SECTION 13710 AND DETAILS ON SHEET E502.																				
5. PROVIDE FIRE ALARM RELAY MODULE AND CONNECT TO DOOR TO UNLOCK DOOR IAW SPECIFICATION SECTION 13710 AND DETAILS ON SHEET E502.																				
6. EXISTING EXIT DOOR EQUIPPED WITH ELECTROMAGNETIC LOCK. REPLACE ELECTROMAGNETIC LOCK WITH ELECTRIC STRIKE. DOOR DETAILS TO BE ISSUED BY ADDENDUM.																				

## **Outlying Areas**

ACS DOOR SCHEDULE

NO.	DOOR/GATE NO.	SHEET NO.	DBC (DOOR CONTROLLER)	SECONDARY ACC (E)	PRIMARY ACC (E)	LOOP NO. (E)	IDC/IRM (E)	LP (E)	BUILDING	DOOR LEVEL	CONTROLLER LOCATION	POWER CIRCUIT (E)	CARD READERS (E)	RTE (E)	DELAYED EGRESS (E)	ALARM HORN (E)	FIRE ALARM RELEASE (E)	EMERGENCY EXIT	COMMENTS
1	FB100	E412	T01S-01	9	0	4	8	8-4	ARFF	1	E & B LEVEL 2	C-6	1	Y	N	N	N	N	
2	FA100A	E412	T01S-01	9	0	4	8	8-4	ARFF	1	E & B LEVEL 2	C-6	1	Y	N	N	N	Y	NOTES 1 & 8
3	GATE N13	E412	T01S-02	9	0	4	4	4-4	ARFF EXTERIOR	N/A	AT GATE	RETAIN EXISTING	2	N	N	N	N	N	EXTERIOR GATE
4	GATE N12	E412	T01S-02	9	0	4	4	4-4	ARFF EXTERIOR	N/A	GATE N13	RETAIN EXISTING	2	N	N	N	N	N	EXTERIOR GATE
5	FB102	E412	T01S-01	9	0	4	9	9-4	ARFF	1	E & B LEVEL 2	C-6	1	Y	N	N	N	N	
6	FB104	E412	T01S-01	-	-	-	-	-	ARFF	1	E & B LEVEL 2	C-6	-	-	-	-	-	-	NOTE 4
7	GATE N14	E412	T01S-03	9	0	4	14	14-4	ARFF EXTERIOR	N/A	AT GATE	P-2	2	N	N	N	N	N	EXTERIOR GATE
8	FB202	E412	T01S-01	9	0	4	10	10-4	ARFF	2	E & 7	C-6	1	Y	N	N	N	N	
9	FA202	E412	T01S-01	9	0	4	10	10-4	ARFF	2	E & 7	C-6	1	Y	N	N	N	N	
10	GATE N10	E005	T00N-01	9	0	4	6	6-4	EXTERIOR	N/A	GATE N10	LOCAL	1	1	N	N	N	N	
11	BADGING OFFICE	E412	T01B-01	9	0	4	11	11-4	BADGING OFFICE	N/A	BADGING OFFICE	A-26	1	N	N	N	N	N	BADGING STATION VERIFICATION CARD READER
12	BADGING OFFICE	E412	T01B-01	9	0	4	12	12-4	BADGING OFFICE	N/A	BADGING OFFICE	A-26	2	N	N	N	N	N	BADGING STATION VERIFICATION CARD READER
13	GATE N30A/B	E005	T00N-02	9	0	4	19	19-4	EXTERIOR	N/A	AT GATE	LOCAL	4	N	N	N	N	N	EXTERIOR GATE
14	GATE N41	E005	T00N-03	9	0	4	7	7-4	EXTERIOR	N/A	AT GATE	LOCAL	1	Y	N	N	N	N	EXTERIOR GATE
15	GATE N64	E005	T00N-04	9	0	5	15	15-5	EXTERIOR	N/A	AT GATE	LOCAL	2	N	N	N	N	N	EXTERIOR GATE
16	GATE E21	E005	T00N-05	10	1	1	12	12-1	EXTERIOR	N/A	AT GATE	LOCAL	1	N	N	N	N	N	EXTERIOR GATE
17	GATE N58A	E006	T00N-06	-	-	-	-	-	EXTERIOR	N/A	AT GATE	LOCAL	1	Y	N	N	N	N	EXTERIOR GATE. NOTE 3.
18	GATE N17A/B	E006	T00N-07	-	-	-	-	-	EXTERIOR	N/A	AT GATE	LOCAL	2	N	N	N	N	N	EXTERIOR GATE. NOTE 2.
19	ST. EMPLOYEE PARKING	E006	T00N-08	10	1	1	3	3-1	EXTERIOR	N/A	AT GATE	LOCAL	3	N	N	N	N	N	EXTERIOR GATE
20	ASIG GATE	E006	T00N-09	9	0	5	16	16-5	EXTERIOR	N/A	AT GATE	LOCAL	4	N	N	N	N	N	EXTERIOR GATE

NOTES

1. PROVIDE FIRE ALARM RELAY MODULE AND CONNECT TO DOOR TO UNLOCK DOOR IAW SPECIFICATION SECTION 13710 AND DETAILS ON SHEET E503.
2. PROVIDE ACCESS CONTROL OF EXISTING GATE N59A. REFER TO SHEET E006, E701 AND SPECIFICATION SECTION 13710 FOR ADDITIONAL INFORMATION.
3. PROVIDE ACCESS CONTROL OF EXISTING GATE N17A/B. REFER TO SHEET E006, E701 AND SPECIFICATION SECTION 13710 FOR ADDITIONAL INFORMATION.
4. PROVIDE ACCESS CONTROL OF EXISTING DOOR FB104. REFER TO SHEET E412, E504 AND SPECIFICATION SECTION 13710 FOR ADDITIONAL INFORMATION.
5. GENERAL NOTE: REUSE EXISTING IDC POWER CIRCUITS FOR DBCs.
6. GENERAL NOTE: REFER TO DETAILS ON SHEET E412 FOR ADDITIONAL INFORMATION ON ARFF DOOR CUTOVERS.
7. GENERAL NOTE: REFER TO DETAILS ON SHEETS E005 AND E006 FOR ADDITIONAL INFORMATION ON REMOTE GATE CUTOVERS.
8. EXISTING EXIT DOOR EQUIPPED WITH ELECTROMAGNETIC LOCK. REPLACE ELECTROMAGNETIC LOCK WITH ELECTRIC STRIKE. DOOR DETAILS TO BE ISSUED BY ADDENDUM.



## **SECTION 13720**

### **ACS SEQUENCE AND CUTOVER**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

- A. Section includes general procedures for sequencing of work and cutover of portals from the existing Access Control and ID Badge System (ACS) to the new ACS as well as cutover of existing ACS subsystems including the Closed-Circuit Television (CCTV), Intercom (IC) and Digital Video Recording (DVR) Systems from the existing ACS to the new ACS. It is the intent of this section to outline the requirements for the development of concise and detailed sequencing and cutover plans and schedules by the Contractor.
- B. Related Sections:
  - 1. Section 01300 – Submittals
  - 2. Section 01540 – Security
  - 3. Section 01310 – Progress Schedules
  - 4. Section 13710 – Access Control System
  - 5. Section 13730 – ACS Performance Verification Testing
  - 6. Section 16995 – Electrical Commissioning
  - 7. Section 16997 – Electrical Functional Testing Requirements
  - 8. Section 16998 – Electrical Prefunctional Installation Examination Requirements
  - 9. Division 16 - Electrical: Sections of Division 16 as they apply to sequencing and cutover of the ACS.

##### **1.2 SUBMITTALS**

- A. Submittals shall conform to the specifications in Section 01300 – Submittals and the requirements of this section.
- B. Weekly and/or Daily Reports as required to detail construction issues that affect construction sequencing and cutover activities for discussion and resolution of issues.
- C. An initial sequence and cutover plan schedule linked to the Contractor's Critical Path Method (CPM) schedule shall be submitted within 90 calendar days from Notice to Proceed (NTP).
- D. Lead Technical Foreman's resume, project descriptions and contact information no later than 30 days from NTP.
- E. Portal Security Plan (PSP) detailing how portals are to be secured during downtime.

- F. Test reports as detailed herein and as specified in other sections of the Contract Documents.

### **1.3 CONSTRUCTION CONSTRAINTS**

- A. The general constraints on the performance of Work in various areas as defined in Section 13710-1.3.B are:
  - 1. Field verify the condition and status of existing portals, conduit routings, etc. and submit any issues in a report to the Department for resolution. Any issues identified shall be corrected prior to cutover of the portal.
  - 2. Contractor shall be responsible for the security of any access portal under modification, repair, replacement, testing or installation under this Contract as detailed in Article 3.1.D below. Submit a Portal Security Plan (PSP) for security of access portals to the Department for approval 30 days prior to the cutover of the first portal.
  - 3. Coordinate Contract work schedules with the Department so as to not interfere with airport operations.

### **1.4 QUALITY ASSURANCE**

- A. Where the work of several trades is involved, coordinate all related work to provide each system complete and in proper operating order.
- B. Cooperate with all others involved in the Project, with due regard to their work, to promote rapid completion of the entire Project.
- C. Local conditions: The Contractor shall thoroughly familiarize itself with the work as well as the local conditions under which the work is to be performed. Schedule work with regard to seasons, weather, climatic conditions, and all other local conditions, which may affect the progress and quality of the work.

## **PART 2 - NOT USED**

## **PART 3 - EXECUTION**

### **3.1 PROJECT SEQUENCING AND CUTOVER PLAN**

- A. Submit a detailed Plan within 90 calendar days after receipt of NTP to the Department for approval. The Plan shall consist of a detailed narrative description of the proposed sequencing and cutover plan for the transition from the existing ACS to the new ACS. The plan shall include a detailed sequencing and cutover schedule which shall be a subset of the Baseline Project Schedule developed in accordance with Section 01310 – Progress Schedules.
- B. Project Sequencing and Cutover Plan:
  - 1. Plan shall include a narrative of the proposed approach to sequencing of the work associated with the installation and cutover of the new ACS, interfaces with the existing security subsystems and cutover of the new access

controllers (DBC's), security portals and field equipment and devices. The narrative shall address at a minimum the following:

- a. How existing system functionality will remain on the existing ACS and be duplicated on the new ACS during parallel operations.
  - b. How the Contractor will ensure that alarm assessment, and control functionality of both systems are preserved during parallel system operation.
  - c. How security will not be compromised and access through portals not restricted for extended periods of time.
2. As part of the Project Sequencing and Cutover Plan Schedule include a detailed schedule of the cutover date and activities associated with each existing ACS loop and individual portal. A schedule detailing project areas only shall not be acceptable. Cutover shall be done on a per loop per portal basis. This schedule shall be updated and submitted to the Department on a weekly basis in the form of detailed 14 day and 7 day look ahead schedules.
  3. In an effort to minimize portal downtime and minimize cutover activities all possible work and testing shall be performed prior to cutover. This includes all installation, programming and pre-testing activities.
  4. Construction Phasing: The construction phasing for the project shall consist of the following phases in an effort to minimize the parallel alarm monitoring and badging operation of the new and existing ACS. The phases shall be as follows:
    - a. Local Area Network (LAN): The expansion of ANC's existing LAN shall be a main priority as a majority of the infrastructure and equipment cabinets required to support this effort are existing. This work shall be done concurrent with other field activities to bring the LAN connectivity to the edge to support the installation of the headend servers in the North and South Terminals and connection of the new access controllers (DBC's) and Alarm, ID Badging, GUI, administrative workstations, and printers.
    - b. Headend Development: The development of the headend software and subsystem interfaces for the new ACS shall run in parallel with field construction activities. The headend software shall not be delivered to site until acceptance of the Factory Acceptance Test (FAT) as detailed in Section 13730. In addition, no cutover activities shall be performed until completion and acceptance of the on-site functional headend testing and acceptance of the Project Sequencing and Cutover Plan by the Department.
    - c. Device installation and cutover in the Air Rescue and Firefighting Facility (ARFF) and remote access controlled gates.
    - d. Device installation and cutover in the Field Maintenance Facility (FMF).
    - e. Device installation and cutover in the North Terminal.
    - f. Device installation and cutover in the South Terminal Concourse C.

- g. Device installation and cutover of all portals in the South Terminal not affected by the South Terminal Seismic and Security Retrofit Project No. 59016.
  - h. DBC, raceway and LAN cable installation in the South Terminal Seismic and Security Retrofit Project No. 59016 areas related to Telecom Rooms (TRs) T15, T16, T18, T20, and T21.
  - i. Installation of work within in the South Terminal Seismic and Security Retrofit Project No. 59016 TRs T15, T16, T18, T20, and T21.
  - j. All remaining work associated with the installation and cutover of the South Terminal Seismic and Security Retrofit Project No. 59016 access controlled portals.
5. In an effort to minimize portal downtime and concurrent operation of the new and existing ACS the construction activities associated with this work shall be as follows:
- a. North Terminal, South Terminal Main Terminal and A/B Concourse Portals not affected by South Terminal Seismic and Security Retrofit Project No. 59016, ARFF, and ID Badge Office:
    - 1). Install DBC in a new enclosure adjacent to the existing Intelligent Device Controller (IDC) enclosure at the locations as detailed on the Contract Drawings.
    - 2). Interface DBCs to doors via Interface Terminal Boxes (ITBs) located adjacent to the security portals. Provide ITBs, power supplies, conduit and cabling as outlined in Section 13710-1.3.B and on the Contract Drawings.
    - 3). Program required portal configuration and application programming prior to cutover. Programming work shall occur concurrent with the LAN and headend development work.
    - 4). Work shall include all required activities to install the DBCs adjacent to the existing IDCs at the locations as detailed on the Contract Drawings.
  - b. South Terminal Concourse C and Field Maintenance Facility:
    - 1). Reuse the existing IDC enclosure and all conduit and cabling between the portal and the IDC.
    - 2). Remove the existing IDCs and replace with the DBCs in the existing enclosure.
    - 3). Re-terminate all existing cabling on the DBC.
    - 4). Program required portal configuration and application programming prior to cutover. Programming work shall occur concurrent with the LAN and headend development work.

- 5). Work shall include all required activities to install the DBCs in the existing IDC enclosures at the locations as detailed on the Contract Drawings.
- 6). South Terminal Seismic and Security Retrofit Project No. 59016:
  - a) In areas affected by Project No. 59016 in the South Terminal Concourses A, B and Main Terminal areas, DBCs shall be installed at locations shown on the Contract Drawings. Field coordinate exact locations with Project No. 59016.
  - b) Program required portal configuration and application programming prior to cutover. Programming work shall occur concurrent with the LAN and headend development work.
  - c) The DBCs shall be interfaced to doors via existing ITBs located adjacent to the security portals. The ITBs and conduit/cabling between the door and ITB will be provided under Project No. 59016 as outlined in Section 13710-1.3.B and on the Contract Drawings.
  - d) This work shall be coordinated with Project No. 59016's schedule to ensure they are brought on-line and accepted by the Department in support of the Contractor's approved Cutover Schedule to ensure the successful completion of both projects.
- 7). Vehicle Gates
  - a) Reuse the existing IDC environmental enclosure and all existing cabling, power supplies, electrical gate hardware and loop detectors unless otherwise noted on Contract Drawings.
  - b) Remove the existing IDCs and replace with the DBCs in the existing enclosure or provide DBC in new environmental enclosure as noted on Contract Drawings.
  - c) Re-terminate existing cabling on the DBC and/or provide new cabling as noted on Contract Drawings.
  - d) Program required portal configuration and application programming prior to cutover. Programming work shall occur concurrent with the LAN and headend development work.
  - e) Work shall include all required activities to remove existing IDCs and provide DBCs at the locations as detailed on the Contract Drawings.
  - f) Fed Ex Gate N17A/B and Gate N59A: Provide equipment as shown on the Contract Drawings.

C. Cutover:

1. Existing Portals (except South Terminal Concourse C and Field Maintenance Facility):
  - a. IDCs are installed at locations in the field in NEMA 1 and NEMA 12 (Environmental) enclosures.
  - b. IDCs communicate to Area Control Computers (ACCs) via Class A fiber optic and copper twisted pair cabling utilizing RS-485 communications protocol.
  - c. Cutover shall be done on a per loop per portal basis starting at one end of a loop working back toward the other end of the loop in order to maintain Class B communications to the remaining IDCs on the loop.
  - d. Upon completion of the installation of the DBC, ITB and connection of new cabling and all termination, test and checkout, the portal shall be cutover to the DBC. After cutover of the portal remove the existing IDC electronics, wrap in anti-static bubble wrap, label IDC with its loop and IDC number and turn over all electronics to the Department. Provide all required demolition of existing IDC enclosures and associated abandoned conduit and boxes as noted on Contract Drawings.
2. Existing Portals: South Terminal Concourse C and Field Maintenance Facility:
  - a. IDCs are installed at locations in the field in NEMA 12 enclosures.
  - b. These IDCs communicate to Area Control Computers (ACCs) via copper twisted pair cabling utilizing RS-485 communications protocol.
  - c. The existing IDC enclosure shall be reused for the DBC.
  - d. Cutover shall be done on a per loop per portal basis starting at one end of a loop working back toward the other end of the loop in order to maintain Class B communications to the remaining IDCs on the loop.
  - e. Remove existing IDC electronics, wrap in anti-static bubble wrap, label IDC with its loop and IDC number and turn over all electronics to the Department.
  - f. Upon completion of the installation of the DBC reconnect existing cabling and test and checkout portal.
3. South Terminal Seismic and Security Retrofit Project No. 59016 ACS Portals:

As part of Project No. 59016 an ITB will be installed to provide a clean demarcation point between the two projects scope of work (SOW).

  - a. The following items will be provided under Project No. 59016:
    - 1). All portal electrical door hardware, card readers, horn/strobe devices, electrical door hardware power supplies and cabling (except for card reader cabling) will be provided and terminated on a terminal strip within the ITB.

- 2). Conduit only will be provided from each ITB location to the future DBC location as detailed on the Contract Drawings.
- 3). Conduit only will be provided from the future DBC location to the local area Telecom Room.
- 4). Fire Alarm Door Release Relay on doors with release requirements will be provided within 36 inches of ITB location.
- b. The following items shall be provided under this project:
  - 1). Conduit and cabling to connect the DBC and ITB as required for connection of all field devices to the DBC as detailed on the Contract Drawings.
  - 2). Card reader cabling between the card reader and the DBC routed via the ITB (card reader cabling shall not terminate in ITB).
  - 3). LAN cabling to connect the DBC to the Ethernet Switch located in the TR.
  - 4). Final testing of Fire Alarm Door Release Relay will be coordinated with Project No. 59016 Contractor (on doors required to unlock upon Fire Alarm).
4. Lead Technical Foreman: Contractor shall provide a Lead Technical Foreman with at least five years' experience in the installation and cutover of ACSs. Lead Technical Foreman shall be fully competent in overseeing the technical and construction requirements of the ACS.
  - a. Contractor shall supply a resume along with descriptions and contacts (name, title, and telephone number) of three similar projects performed by the individual for approval within 30 calendar days from NTP.
  - b. The Department reserves the right to interview the proposed Lead Technical Foreman prior to approval.
  - c. Any costs or impacts which may arise due to the Contractor's inability to submit a qualified individual as the Lead Technical Foreman shall be borne by the Contractor.
  - d. Lead Technical Foreman shall be responsible for supervising construction and cutover of all headend, field equipment and devices; shall serve as the main field point of contact for the Department and shall perform all required coordination with the Department and other projects such as the South Terminal Seismic and Security Retrofit Project No. 59016.
  - e. Lead Technical Foreman shall have specific experience with integrating security subsystems systems in similar environments.
  - f. Lead Technical Foreman shall be dedicated to the Project from time of acceptance through project closeout, however, Foreman can perform other project related tasks. The Lead Technical Foreman or

designated other (as approved by the Department) shall be on-call 24/7 from the time of the start of cutover activities through to project acceptance.

D. Disruption of Service

1. Provide written notification of any disruption to service, including portal and equipment downtime at least three working days, not including weekends, prior to the shutoff or disruption. This shall be in the form of the detailed 7-day look ahead schedule.
2. Coordinate with the Department to schedule disruption for a time that minimizes impact on facility operations and tenants.
3. Coordinate any and all outages of the existing ACS with the Project Manager, the Airport Security Manager, and affected tenants. No outages shall be allowed without prior coordination and approval.
4. Execute work under supervision of the Lead Technical Foreman in accordance with manufacturer's instructions and the Department's requirements.
5. Maintain a security watch at all portals during the time existing portals are off-line until the modified portals are brought back on-line, tested, approved and verified by the Contractor and the Department. Security watches shall be in accordance with Section 01540 - Security. While a portal is off-line, the portal shall be unavailable for use by anyone other than the Contractor, and the Contractor shall be responsible for maintaining the integrity of the ACS. The portal shall be attended at all times by a properly badged representative of the Contractor to ensure that no one enters or exits the portal during the time that it is off-line. Failure to maintain the integrity of the portal may result in a fine by the Transportation Security Administration (TSA) payable by the Contractor, for each such occurrence.

E. General: Portal Cutovers

1. Portals shall be taken off-line per the approved cutover schedule.
2. Prior to returning a portal to service, inspect items of equipment and systems to ensure that:
  - a. Installation is in accordance with manufacturer's instructions.
  - b. Defective items have not been installed and there are no loose connections.
  - c. Power supplies are correct voltage, phasing, and frequency.
  - d. Grounding and transient voltage protection systems are properly installed.
  - e. Items have been wired, labeled and checked against approved submittal drawings.
  - f. Software installed and tested for proper operation.
3. Once a portal has been taken off-line from the existing ACS, work shall be continuous until the portal is connected to the new ACS.



4. Submit a daily written report itemizing what equipment has been properly installed and is functioning correctly, what portals have been successfully cutover and detailing any outstanding issues or problems.

### 3.2 TESTING

- A. General: Perform testing and adjustment of the ACS in accordance with Specification 13730 and the following:
  1. Provide all personnel, equipment, instrumentation, communications equipment (radios, cell phones, etc.) and supplies necessary to perform all testing.
  2. Written notification of planned testing shall be given to the Department as specified in the Contract Documents or at a minimum 14 days prior to the test, and in no case shall notice be given until after the Contractor has received written approval of the specific test procedures.
- B. Test Procedures and Reports: Test procedures shall explain, in detail, step-by-step actions and expected results demonstrating compliance with the requirements of the Specification.
  1. Test reports shall be used to document results of the tests.
  2. Reports shall be submitted to the Department for approval within 7 calendar days after completion of each test.
- C. Existing Portals:
  1. Prior to cutover and pre-functional and functional testing of a portal the Contractor shall test all existing door functionality and alarm annunciation at one of the two existing ARFF Dispatch Alarm Workstations to ensure proper operation of the portal. The individual performing the test activities in Dispatch shall be provided by the Contractor. At the option of the Department, all existing portal testing shall be witnessed by a Department designated representative. All testing shall be documented in the form of an approved Portal Test Report and submitted to the Department for approval.
  2. Upon completion of the cutover of the portal the Contractor shall test all door functionality and alarm annunciation at a new Alarm Workstation operated by the Contractor at an approved location other than Dispatch. Alarms shall be routed to this Alarm Workstation during the testing period and acknowledged by the Contractor. Upon completion of successful testing by the Contractor all alarms for the portal shall be routed to the new Dispatch Alarm workstations and Dispatch shall be immediately notified that the cutover has been successful and the portal is now the responsibility of ANC. All testing shall be documented in the form of an approved Portal Test Report and submitted to the Department for approval.
- D. South Terminal Seismic and Security Retrofit Project No. 59016 ACS Portals:
  1. The Contractor and a Department designated representative shall witness the testing of these portals at the ITB terminal strip to ensure proper

operation of the new security door devices prior to turnover of the portal. The Project No. 59016 Contractor shall provide all test equipment to demonstrate proper functionality of the portal. Upon successful completion of the testing of the portal the Contractor and a Department representative shall sign a portal Door Test Report developed by the Project No. 59016 Contractor and accept the portal for connection to the ACS.

2. Upon completion of the startup and commissioning of the new portal the Contractor shall test all door functionality and alarm annunciation at a new Alarm Workstation operated by the Contractor at an approved location other than Dispatch. Alarms shall be routed to this Alarm Workstation during the testing period and acknowledged by the Contractor. Upon successful testing by the Contractor all alarms for the portal shall be routed to the new Dispatch Alarm workstations and Dispatch shall be immediately notified that the cutover has been successful and the portal is now the responsibility of ANC. All testing shall be documented in the form of an approved Portal Test Report and submitted to the Department for approval.

**END OF SECTION 13720**

## **SECTION 13730**

### **ACS PERFORMANCE VERIFICATION TESTING**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

**A. Section Includes:**

1. General description, functional requirements, characteristics, and criteria for the complete testing of the Access Control System (ACS) and subsystems.

**B. Related Sections:**

1. Section 01300 – Submittals
2. Section 13710 – Access Control System (ACS)
3. Section 13720 – ACS Sequence and Cutover
4. Section 16010 – Electrical General Requirements
5. Section 16995 – Electrical Commissioning
6. Section 16997 – Electrical Functional Testing Requirements
7. Section 16998 – Electrical Prefunctional Installation Examination Requirements
8. Division 16 - Electrical: Other sections of Division 16 as they apply to testing of the ACS.

##### **1.2 GENERAL**

- A. Prepare, submit for the Department's review, and execute, test plans and procedures to demonstrate system completion and performance. Except as otherwise specified, test all components, connections, and subsystems comprising the total ACS as described in the Contract Documents as a complete, operational system. Testing shall include, but is not limited to:**

1. Factory acceptance testing.
2. Software functional and performance testing.
3. Device level functional testing.
4. Performance verification (operational) testing.
5. 30-day system acceptance testing.
6. Site acceptance testing.
7. Additional system specific testing included in the relevant Specifications and on the Contract Drawings.

- B. Testing shall demonstrate compliance with the specifications and the Contract Document requirements.**

- C. Adjust and correct systems and equipment to ensure proper operation.**

### **1.3 SUBMITTALS**

- A. Furnish testing documentation in accordance with Section 01300 - Submittals and based on the approved Test Plan and procedures.
- B. Certify that the Contractor has successfully completed startup and commissioning of a complete integrated ACS and that it is ready for demonstration of compliance with Contract requirements.
- C. Develop and submit a detailed Test Plan within 120 calendar days after Notice to Proceed (NTP). The Plan shall include an outline of proposed test procedures for approval by the Department.
- D. Submit test procedures a minimum of 30 calendar days prior to testing covered by the procedures. The test procedures shall include a sample of data forms to be used during performance verification testing.
- E. Submit the test results within 5 days after testing.

### **1.4 QUALITY ASSURANCE**

- A. Where required by individual Sections provide the services of manufacturer's representatives for final testing and adjusting of system and equipment at no additional cost to the Department.
- B. Perform any additional tests found in related Sections or required to ensure the reliable performance of systems provided under this Contract.

## **PART 2 - PRODUCTS - NOT USED**

## **PART 3 - EXECUTION**

### **3.1 GENERAL**

- A. Coordinate all testing activities of this Section and related Sections with the Engineer and Department for all testing activities.
- B. The Factory Acceptance Test, Site Acceptance Test, Software Functional and Performance Test and Site Acceptance Test will be witnessed by the Department or other designated representatives of the Department. The Department or representative(s) may elect to witness any or all other tests.
- C. Furnish all personnel, equipment, tools, software, means of communications, test instrumentation, and supplies necessary to perform all testing.

D. Written notification of testing shall be given to the Department at a minimum 14 calendar days prior to the test and in no case shall notice be given until after the Contractor has received written approval of the specific test procedures.

1. Do not begin testing until:
  - a. All equipment and systems have been installed properly and have been individually and jointly tested to ensure that they are operating properly.
  - b. Certification specified in Part 1.3 has been submitted.
  - c. Written authorization from Department has been received.

### **3.2 TEST PLAN**

A. Prepare a Test Plan. The approved Test Plan shall serve as the basis for the detailed test procedures submittal described in Part 3.3.

B. The Test Plan shall:

1. Include an overall testing schedule which shall be a subset of the Baseline Project Schedule developed in accordance with Section 01310 – Progress Schedules or tests to be performed.
2. Detail means and methods by which the Contractor shall perform testing of the systems and equipment delivered.
3. Define the types of tests to be performed during each of the following phases of testing:
  - a. Installation Verification (Prefunctional)
  - b. Factory Acceptance
  - c. Software Functional and Performance
  - d. Device Level (Prefunctional)
  - e. Performance Verification (Functional)
  - f. Site Acceptance
  - g. 30-Day Site Acceptance
4. Describe the types of test equipment, software, hardware, and simulators, proposed for each testing phase.
5. Define and detail the test methodology for verifying the system requirements, satisfying the performance and availability criteria, and satisfying the specifications.
6. Detail how the Contractor plans to implement its testing procedures.

C. Update the Test Plan and procedures as necessary and obtain the Departments written acceptance of the Test Plan prior to beginning any testing.

### 3.3 TEST PROCEDURES

- A. Prepare procedures for each test phase detailing the topics and aspects that will be part of the tests. The procedures shall demonstrate and verify performance and reliability as defined within the Contract Documents.
- B. The test procedures and their associated checklists shall be organized and cross referenced to identify the specification requirements set forth in the Contract Documents to which the test demonstrates and verifies compliance.
- C. At a minimum, each test procedure shall include the following:
  - 1. A description of how each requirement expressed in the Specifications shall be tracked to one or more test procedures.
  - 2. The specific Test Plan item and schedule.
  - 3. An identification of the stage of implementation and integration at which each test is to be carried out and the planned timing of the test.
  - 4. The location and purpose of the test.
  - 5. The platform, subject systems, and test systems required.
  - 6. Description of the actual means by which individual components are tested.
  - 7. Reference to the appropriate test procedure to be used. Each test procedure shall be specific to either an individual test or a fully coordinated suite of identifiable tests common to a single requirement.
  - 8. Procedures for documentation and recording of test results.
  - 9. Sample test forms and checklists.
  - 10. Procedures for handling test anomalies and failures.
  - 11. Resources and prerequisites required for the test including test equipment and personnel.
  - 12. The entity responsible for the testing and the personnel who will conduct the test.
  - 13. The person responsible for writing the test procedures.
- D. At completion of each test submit a test report to the Department within 5 days.

### 3.4 GENERAL TESTING REQUIREMENTS

- A. Test certification: Test certificates shall be issued upon the successful completion of each test phase for acceptance by the Department.
- B. Test failures: In the event any system element fails to meet part of the acceptance test, an observation report shall be submitted in writing detailing the test failure.
- C. Re-testing: During the acceptance tests the Department reserves the right to request and witness the re-execution of any individual test or set thereof.
- D. Observations: All observations reported in writing shall be submitted to the Department before the conclusion of the acceptance test. At the Department's discretion, waivers may be issued and recorded to clear specific observations if

the Contractor explains how the observed behavior does not impact the required functionality or performance of the system.

E. Testing documentation:

1. A full set of all required system documentation shall be made available prior to the commencement of the test.
2. At the conclusion of testing the Contractor shall provide the Department with all test documentation for review and approval within 5 days.

**3.5 FACTORY ACCEPTANCE TESTING (FAT)**

A. Prepare a factory simulation test to demonstrate that the development of the following software and hardware complies with the Contract specifications:

1. ACS shall include but not be limited to:
  - a. Complete ACS software functionality as it applies to this project.
  - b. Server Redundancy.
  - c. Access Controller Standalone operation.
  - d. Redundant Communication (If Additive Alternate Accepted)
  - e. Graphical User Interface utilizing actual site maps and icons developed for use on the project.
  - f. ID Badge enrollment including Identification Scanner, Biometrics, card encoding and card production.
  - g. Examples of ID Badge Reports.
2. Subsystem interfaces (DVRs, CCTV, and Intercom).
3. Biometric Fingerprint Reader operation.
4. CCTV Alarm Video Call-up functionality.
5. Intercom Call-up functionality.
6. Chexit Pre-Alarm intercom and video call-up.
7. Ethernet communications.
8. Simulation of ACS portal alarms and trouble conditions including but not limited to:
  - a. Door Held Open
  - b. Door Forced Open
  - c. Duress
  - d. Tamper (All)
  - e. Low Battery
  - f. AC Power Loss
  - g. Invalid Card
  - h. Stolen Card
  - i. Lost Card
  - j. System Trouble Conditions
  - k. Delayed Egress Pre-Alarm

B. Factory Acceptance Test (FAT) shall be conducted no later than 180 calendar days from Notice to Proceed.

- C. Provide the Department notification of readiness to perform factory acceptance testing at least 30 days prior to the tests.
- D. Prepare a test report using formats and structure specified under Article 3.13.
- E. Failure of the factory acceptance test may, at the discretion of the Department, delay the full implementation of the ACS in the field.
- F. The factory test location shall be defined by the Contractor. The site may be at the Contractor's system implementation facility or at a system test facility established in close proximity to the Airport.
- G. All costs for transportation, lodging, meals, and other related costs for Engineer and Department personnel to attend the factory tests shall be paid by the Contractor.
- H. Department and Engineer staff attending the tests will be limited to a maximum of eight individuals.
- I. Provide test plans and procedures for the FAT as specified in Articles 3.2 and 3.3.

### **3.6 SOFTWARE FUNCTIONAL AND PERFORMANCE TESTING**

- A. The on-site real-time functional and performance tests shall be performed and accepted by the Department prior to the performance verification (functional) testing.
- B. The on-site real-time functional and performance tests shall be incorporated in the overall test procedures.
- C. The on-site functional and performance test shall demonstrate to the Department that all software development and programming is complete and in compliance with the Contract Documents.
- D. The test results shall be integrated into the overall test report.
- E. Provide a test plans and procedures for the software functional and performance testing as specified in Articles 3.2 and 3.3.

### **3.7 DEVICE-LEVEL (PREFUNCTIONAL) TESTING**

- A. Following completion of each area of installation perform device-level prefunctional tests on individual components, equipment, and related components. The intent of these tests shall be to verify proper function of individual components prior to integrated system functional testing.
- B. Notify the Department in writing 14 days in advance of the prefunctional test.
- C. At the discretion of the Department, the Department may elect to attend and participate in the tests.
- D. Coordinate with the Department scheduling of all tests.



- E. Prefunctionally test all access controlled portal devices locally at the portal.
- F. Provide test plans and procedures for the prefunctional testing as specified in Articles 3.2 and 3.3.
- G. Prepare all test data required to perform the prefunctional test in accordance with the specifications.
- H. The results of all preliminary tests shall be logged and submitted to the Department for approval within 5 days.

### 3.8 PERFORMANCE VERIFICATION (FUNCTIONAL) TESTING

- A. As part of performance verification test all components of the ACS. Functional tests validate that the Contractor has verified all functional requirements as stated in this specification. They also verify all of the functionality required in the Contract Documents.
- B. After completion of installation verification and all prefunctional tests the Contractor shall functionally test the portal.
- C. The Functional Test shall:
  - 1. Upon verification of device operability, test the equipment back to the equipment room.
  - 2. Upon verification of device operability at the equipment room test device operability from the equipment room to the headend equipment.
  - 3. Test the interoperability of each graphical user interface (GUI) icon for each device installed.
  - 4. Test all subsystem interfaces and functionality
- D. Provide a test plans and procedures for the functional testing as specified in Articles 3.2 and 3.3.
- E. All devices, equipment and system integration shall be tested **100 percent**. This is to include all ACS alarm and trouble conditions including but not limited to:
  - a. Door Held Open
  - b. Door Forced Open
  - c. Duress
  - d. Tamper (All)
  - e. Low Battery
  - f. AC Power Loss
  - g. Invalid Card
  - h. Stolen Card
  - i. Lost Card
  - j. System Trouble Conditions
  - k. Delayed Egress Pre-Alarm
- F. Field-mounted devices shall be tested via actual activation of the devices under normal operating conditions rather than simulated activations.

- G. Where system testing will cause outages or impacts, schedule testing activities so as to impose the least inconvenience on system users, Airport tenants, and other Airport agencies. This may require that the Contractor schedule testing off shift in order to avoid conflicts with airport operations.
- H. The Functional Test Report shall document the following:
  - 1. That the system in its entirety meets all requirements of the Contract Documents.
  - 2. That system equipment meets all requirements of the Contract Documents.
  - 3. That all system functions and operations meet all requirements of the Contract Documents.
- I. Functional Testing shall be performed in a phased manner as defined within Specifications 01015 and 13720.

### **3.9 30-DAY ACCEPTANCE TESTING**

- A. After completion of all functional testing the system shall be continuously tested as a whole for a period of 30 days.
- B. During this period testing shall include, but not be limited to, the following to verify that all aspects of the system are fully operational and in compliance with the specifications:
  - 1. Operational functions.
  - 2. DVRS, CCTV and Intercom Subsystem operation.
  - 3. GUI functions.
  - 4. Delayed egress system modifications.
  - 5. Portal operation.
  - 6. System programming.
  - 7. System integration.
  - 8. System redundancy (Ethernet, DBC, Server)
- C. The tests shall include all potential aspects of operations including contingencies, priorities, component/power failure, abnormal modes of operation, and external interfaces.
- D. Maintain a log of system performance during all phases of the testing. Upon completion this log shall be utilize to derive a punch list of items to be rectified prior to the Site Acceptance Test (SAT).
- E. The intent of the 30-Day Acceptance Test is for the system to operate error free to ensure overall system stability and proper installation, programming and test and checkout. Upon completion of the test the Contractor shall review with the Department the log entries and a determination of the acceptance of the test shall be made by the Department. If the test is determined a failure all outstanding punch list items shall be rectified and the test shall be performed again until overall system performance is deemed acceptable by the Department.

- F. All deficiencies shall be corrected and re-tested. Copies of all 30-Day Acceptance Test logs and corrected punch lists shall be submitted to the Department prior to SAT.
- G. Provide a test plans and procedures for the 30-Day Acceptance Test as specified in Articles 3.2 and 3.3.

### **3.10 SITE ACCEPTANCE TESTING (SAT)**

- A. The SAT verifies to the Department that the systems comply with all specification requirements, the Contractor has completed all prior specified tests, rectified all punch list items and the system is ready for overall acceptance by the Department.
- B. Inform the Department when all tests have been completed and the SAT shall be planned.
- C. Notify the Department in writing 21 days in advance of the SAT.
- D. At the discretion of the Department, the Department may elect to attend and participate in the tests or appoint a representative to view the tests.
- E. Site acceptance testing shall be conducted on all supplied equipment and devices. The SAT shall include, at a minimum, the following:
  - 1. Full configuration audits for hardware, software, operating systems, and embedded systems.
  - 2. Full functional audits for hardware, software, operating systems, and embedded systems.
  - 3. Full configuration audits of all logistic support systems and parts, including hardware, software, operating systems, and embedded systems.
  - 4. Evaluation of all system activities and functions.
  - 5. Full configuration audits of all system documentation, operation manuals, training manuals, as-built drawings, etc.
  - 6. Evaluation of all training documentation and schedules.
- F. Provide a test plans and procedures for the SAT as specified in Articles 3.2 and 3.3.

### **3.11 TEST TERMINATION**

- A. Testing shall be terminated when:
  - 1. Individual components, subsystems, or the integrated system fail to perform as specified.
  - 2. It is determined that the system is missing components or installation is not complete.
- B. Upon termination, corrective work shall be performed and testing rescheduled with the Department.

- C. Further testing due to termination shall be at no additional Contract cost.

### **3.12 ADJUSTMENT, CORRECTION, AND COMPLETION**

- A. Correct deficiencies and retest affected components.
- B. Make necessary adjustments and modification to system after obtaining approval of the Department.
- C. Testing shall be complete when testing or retesting of equipment, systems, and components have produced a positive result and the test results have been approved in writing by the Department.
- D. If, during testing, the system fails to achieve the required standard for acceptance, the Contractor shall resubmit the system for testing after taking such remedial steps as necessary to correct the deficiency.

### **3.13 RECORDING**

- A. Compile and provide an Acceptance Test Master Report (ATMR) that includes the following:
  - 1. Approved test plan and procedures
  - 2. Equipment and personnel used to perform the tests.
  - 3. All test results, deficiencies, corrective measures, and observations for all system elements (recorded in tabular form).
  - 4. Test certificates and Certificates of Compliance and Conformance for all system elements.
  - 5. Date and time stamp identifying when each test was performed.
  - 6. Confirmation in writing that all training has been performed.
  - 7. Confirmation all record documents have been received and approved by the Department.
  - 8. Confirmation all extra materials have been received the Department.
  - 9. Confirmation all software licenses have been received by the Department.
- B. The ATMR shall be submitted to the Department for approval not later than 10 days after the completion of the SAT.

### **3.14 SYSTEM ACCEPTANCE**

- A. System acceptance shall occur at the time of approval of the ATMR by the Department. The warranty period shall begin from the date of the approval of the ATMR report.

**END OF SECTION 13730**

## **SECTION 15010**

### **MECHANICAL GENERAL REQUIREMENTS**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

**A. Section Includes:**

1. Supplemental requirements in addition to Division 1 – General Requirements applicable to all Division 15 – Mechanical Specification Sections.

**B. Related Sections:**

15075	MECHANICAL IDENTIFICATION
15080	MECHANICAL INSULATION
15181	HYDRONIC PIPING & SPECIALTIES
15182	HVAC PUMPS AND EQUIPMENT
15900	BUILDING AUTOMATION SYSTEM

##### **1.2 REFERENCES**

**A. Codes**

1. Perform work in accordance with the latest legally enacted editions of applicable international, state and local codes with locally accepted amendments to include:
  - a. International Building Code (IBC), 2006.
  - b. International Mechanical Code (IMC), 2006.
  - c. Uniform Plumbing Code (UPC), 2006.
  - d. International Fire Code (IFC), 2006.
  - e. NFPA 70, National Electric Code (NEC), 2005.

**B. Standards:**

1. Provide materials, equipment, and installation methods which comply with the current standards of the following trade organizations:
  - a. American Society of Heating Refrigerating and Air Conditioning Engineers - ASHRAE.
  - b. National Fire Protection Association - NFPA.
  - c. Sheet Metal and Air Conditioning Contractors National Association, Inc. - SMACNA.
  - d. American National Standards Institute - ANSI.
  - e. American Society for Testing and Materials - ASTM.
  - f. American Society of Mechanical Engineers - ASME.

g. National Electrical Manufacturers' Association - NEMA.

**1.3 DEFINITIONS**

- A. "Accessible" means arranged so that an appropriately dressed man 6'-2" tall, weighing 250 pounds, may approach the area in question with the tools and products necessary for the work intended; and may then position himself to properly perform the task to be accomplished, without disassembly or damage to the surrounding installation.
- B. "Administrative Authority" is the individual official, board, department, or agency established and authorized by the political subdivision created by law to administer and enforce the provisions of the Code as adopted or amended.
- C. "As Specified" denotes a product, system, or installation that:
  - 1. Includes salient characteristics identified in the Drawings and Specifications.
  - 2. Meets the requirements of the "basis of design".
  - 3. Is produced by a manufacturer listed as acceptable on the Drawings or in the Specifications.
- D. "Basis of Design" refers to products around which the design was prepared. Some or all of the particular characteristics of Basis of Design products may be critical to the fit or performance of the completed installation. Such characteristics are often subtle. Where substitutions are made to products that are the Basis of Design, the Contractor is alerted that nominally acceptable substitutions may produce undesirable side effects such as products that no longer fit the space due to increased product dimensions. The Contractor is responsible for resolving impacts of substitutions. Approval of a substitution request does not relieve the Contractor of complying with the design intent and applicable Codes.
- E. "Furnish" means to purchase material as shown and specified, and cart the material to an approved location at the site or elsewhere as noted or agreed, to be installed by supporting crafts.
- F. "Install" means to set in place and connect, ready for use and in complete and properly operating finished condition, material that has been furnished.
- G. "Product" is a generic term that includes materials, equipment, fixtures and any physical item used on the project.
- H. "Provide" means furnish products, labor, subcontracts, and appurtenances required and install to a complete and properly operating, finished condition.
- I. Reference to a specific manufacturer's product (even as "Basis of Design") does not necessarily establish acceptability of that product without regard to compliance with other provisions of these specifications.

- J. "Rough-in and Connect" means provide an appropriate system connection such as, water services with stops, continuous wastes with traps, shutoff valves, and piping connections, testing, etc., for proper operation, and to install products furnished. Equipment furnished is received, uncrated, assembled and set in place by supporting crafts unless they make prior arrangements to hire the installer for this work.
- K. "Serviceable" means arranged so that the component or product in question may be properly removed, and replaced without disassembly, destruction or damage to the surrounding installation. "Serviceable" components shall be "accessible".
- L. "Shop Drawings" are dimensioned working construction drawings drawn to scale to show an entire area of work in sufficient detail to demonstrate service and maintenance clearances and complete coordination of all trades.
- M. Streamlining in many instances, the products, reference standards, and other itemized specifications have been listed without verbiage. In these cases, it is implied that the Contractor shall provide the products and perform in accordance with the references listed.
- N. "Substitution" is a product, system or installation that is not by a listed manufacturer or does not conform to all salient characteristics identified in the Contract Documents, but that the Contractor warrants meets specific requirements listed in the Contract Documents.
- O. "System Drawing" is a diagrammatic engineered drawing that shows the interconnection and relationship between products to demonstrate how the products interact to accomplish the function intended. Examples of system drawings include plumbing diagrams, control and instrumentation diagrams, and wiring diagrams. Some drawings, such as dimensioned and complete Fire Protection Drawings may be both System Drawings and Shop Drawings.

#### **1.4 SYSTEM DESCRIPTION**

##### **A. Performance Requirements:**

- 1. Provide labor, products and services required for the complete installation, checkout, and startup of mechanical systems shown and specified. Coordinate related work, including the work of other crafts, to provide each system complete and in proper operating order.
- 2. Cooperate with others involved in the project; with due regard to their work, to promote rapid completion of the entire project.
- 3. Local Conditions: Become thoroughly familiar with the local conditions under which the work is to be performed. Schedule work with regard to seasons, weather, climatic conditions, and other local conditions that may affect the progress and quality of the work.
- 4. Demolition: Coordinate and perform demolition in support of the project whether or not such requirements are described on the Drawings.

5. In general, the mechanical, electrical and building automation systems are interrelated. Coordinate the interface and operation of systems so that interrelated systems operate in proper synchronization and balance.
6. Provide labor, materials, and equipment as required to facilitate the commissioning process of systems and equipment within this scope of work. Perform tests and verification procedures required for the commissioning process as requested by The Department.

## **1.5 SUBMITTALS**

- A. General: Provide submittal literature, narratives and drawings for products and systems described in Division 15 and as shown on the drawings to demonstrate compliance with the requirements of the Contract Documents.
- B. Provide submittals in the manner described elsewhere in these specifications. Refer to Section 01300 - Submittals. In addition, prepare every submittal or partial submittal as noted below.
- C. Product Submittals:
  1. Provide submittals for products.
  2. Mark submittal literature clearly and bind 8-1/2 by 11 inch literature in three-hole loose-leaf binders by individual sets. Do not overload binders.
  3. Separate partial submittals into complete system classifications such as: plumbing, fire protection, etc. Specification section numbers may be used as a guide. Incomplete submittals and submittals not logically organized by system will be rejected.
  4. Include the project name, the name of the Contractor and Subcontractor preparing the submittal and the date that the submittal or resubmittal was initiated.
  5. Specification reference and/or drawing reference for which literature is submitted for review with an index, following specification format, and item by item identification.
  6. Manufacturer's name and address, and supplier's name, address, and phone number.
  7. Catalog designation or model number.
  8. Rough-in data and dimensions and/or working construction drawings (shop drawings).
  9. Performance curves and rated capacities.
  10. Motor characteristics and wiring diagrams for the specific system operation.
  11. Operation characteristics.
  12. A customized listing of the characteristics identified in the Contract Documents. Indicate whether each item is submitted as "Basis of Design", "As Specified" or "Proposed Substitution". On product data sheets, clearly



indicate the data that shows the product meets the requirements. Indicate deviations and mark out non-applicable items.

13. Manufacturer's Installation Instructions.
14. Submittals not completely marked as indicated above will be rejected without review.
15. Substitutions:
  - a. Substitution requests shall be provided in accordance with Section 01600 - Materials and Equipment. Additional requirements are indicated below.
  - b. Clearly identify in the submittal index proposed substitutions, deviations or changes of any type whatsoever from the products or systems specified and shown. Submittal approval will not include such deviations unless they are specifically itemized and approved; the term "No Exceptions Taken" will not apply to substitutions or deviations not clearly identified.
  - c. Provision of a complete and satisfactory working installation of equal quality to the system specified is the responsibility of the Contractor.
  - d. Correct unapproved deviations discovered in the field as directed by The Department at no additional cost to the Owner.

D. Shop Drawings:

1. The Contract Documents are not intended for nor are they suitable for use as shop drawings. Contract Documents shall not be utilized for the fabrication or installation of products or equipment.
2. Prepare and submit working construction drawings as requested, specified, or otherwise necessary to demonstrate proper planning for installation and arrangement of work.
3. Lay out drawings to scale and show dimensions where accuracy of location is necessary for coordination or communication purposes. Scale shall be appropriate to clearly show all aspects of the installation and equipment arrangement.
4. Show the interrelated work of all trades, including Architectural, Structural, Mechanical, and Electrical items which are pertinent to proper and accurate coordination and conflict resolution.
5. In cases where one or more equipment items in a mechanical room or space differ in dimensions or configuration from basis of design equipment, provide shop drawings to show the entire area.
6. Dimension shop drawings to demonstrate that required aisle ways and maintenance clearances are being maintained.

E. Record Drawings:

1. General: As the Work progresses, neatly annotate a designated and otherwise unused, set of Division 15 Contract Drawings to show the actual locations and routing of Division 15 Work and the terminal connection points to related Work. As a minimum, include the following:
  - a. Annotate record drawings to incorporate each applicable addendum.
  - b. Annotate record drawings as directed by each applicable Design Clarification/Verification Request (DC/VR) and accepted Change Order Proposal.
  - c. Modify record drawings to show actual equipment sizes and locations and pipe and duct routing. Revise pipe and duct sizes as appropriate.
  - d. Provide fully dimensioned locations for permanently concealed piping and ductwork (i.e. piping cast in concrete or buried underground/underslab).
  - e. Show the actual locations of system isolation valves, especially valves which are concealed above ceilings and behind access panels.
2. Preparation:
  - a. Neatly annotate record drawings to provide clear interpretation to support electronic drafting by a third party.
  - b. Tape electronic sketches from addendums and/or DC/VRs directly to the record drawings as overlays.
  - c. Annotate the record drawings in colored pencil using the same symbols and abbreviations as indicated in the Division 15 legends and schedules of the Contract Drawings. Use the color red to add information; the color green to delete information; and the color blue to provide additional clarifying information which is not to be drafted.
  - d. After submittal to the Department, provide additional clarification, information or rework as necessary to support the accurate interpretation and electronic drafting of the record drawings.
3. Submittals:
  - a. Provide complete underslab record drawings to the Department prior to pouring the slab. For slabs poured in multiple sections, provide record drawings for the applicable slab sections to the Department prior to the pour.
  - b. Provide complete record drawings for concealed areas (i.e. above lay-in and hard ceilings and inside walls) to the Department prior to concealment.
  - c. Provide the remaining portion of the record drawings for exposed areas to the Department prior to final completion of the project.

F. Test Certificates:

1. Submit individual certificates in writing, documenting that specified tests have been made in accordance with the specifications.

G. Operations and Maintenance (O&M) Manuals:

1. Submit O&M manuals in the manner specified elsewhere in this section.
2. Provide Operation and Maintenance Manuals in accordance with Section 01700 - Contract Closeout.
3. Provide Operation and Maintenance Manuals in the manner described elsewhere in these specifications. In addition, organize manual and include data and narrative as noted below. Bind manuals in hard-backed loose-leaf binders. When necessary, divide into multiple volumes so that the pages in each binder rest naturally on one side of rings.
4. Provide a separate chapter for each section of the mechanical specifications with subchapters for each class of equipment or system. Provide a table of contents for each chapter, and each major item in each chapter, to indicate the page number of each. Label each page to assure correct placement in manual. Identify each piece of equipment with its associated nameplate number, i.e., pump PMP-1, etc.
5. Operating Sequence Narrative:
  - a. Describe procedures for start-up, operation, emergency operation, and shutdown of each system. If a particular sequence is required, give step-by-step instructions in order.
  - b. Provide the above descriptions in typewritten, simple outline, narrative form.
6. Maintenance Instructions:
  - a. Provide complete information for preventive maintenance for each product, including recommended frequency of performance for each preventive maintenance task.
  - b. Provide instructions for minor repair or adjustments required for preventive maintenance routines, limited to repairs and adjustments that may be performed without special tools or test equipment and that require no extensive special training or skills.
  - c. Provide information of a maintenance nature covering warranty items, etc., that have not been discussed in the manufacturers' literature or the operating sequence narrative.
  - d. Provide complete information data for the spare and replacement parts for each product and system. Properly identify each part by part number and manufacturer.
7. Manufacturers' Brochures:
  - a. Include manufacturers' written installation, operation and maintenance manuals and other descriptive literature covering products used in

each system, together with illustrations, wiring diagrams, exploded views and renewal parts lists.

- b. Highlight applicable items and instructions, or mark out non-applicable items.

H. Submittal Review:

1. Submittal review is for general design and arrangement only and does not relieve the Contractor from any of the requirements of the Contract Documents.
2. Submittals will not be checked for quantity.
3. Submittals will not be exhaustively checked for dimension or fit, or for proper technical design of manufactured equipment. Provision of a complete and satisfactory working installation is the responsibility of the Contractor.
4. Furnish suppliers with applicable sections of the specifications and applicable drawings and verify the suppliers' submittals clearly represent products fully complying with the Contract Documents.

## 1.6 QUALITY ASSURANCE

A. Qualifications:

1. Perform the Work using qualified workmen that are experienced and usually employed in the trade.

B. Product Testing and Certification:

1. Where the words Listed, UL Listed, UL Labeled, Underwriters Laboratories, Inc., UL, or variations of this terminology, appear under this division of the Specifications or the associated drawings, it is understood that a comparable testing agency as defined in the International Building Code is an acceptable substitute.
2. Such testing and certification is generally applicable to products within the following categories.
  - a. Life safety and fire protection.
3. The listing under Paragraph 'B' above is provided for illustration of requirements and is not exclusive. Provide products that have been tested and listed for the intended application when such products are available unless The Department has provided written exemption on an itemized basis. Provide electrical products listed and labeled.
4. Where interpretation is required, The Department will provide direction and will be the sole judge in cases of compliance with this subsection.

C. Drawings and Specifications:

1. The drawings and specifications are complementary. Do not scale the drawings. Locations of products are approximate unless dimensioned.

2. The drawings are partly diagrammatic and do not show all offsets in ducts, or exact location of products, and may not show in minute detail all features of the installation; however, provide systems complete and in proper operating order.
3. Drawing symbols used for basic materials, equipment and methods are commonly used by the industry. Special items are identified by a supplementary list of graphical illustrations, or called for on the drawings or in the specifications.

**D. Tests and Inspections:**

1. Owner may inspect and approve sample installation of systems and equipment prior to general installation of units.
2. Schedule, obtain, and pay for fees and/or services required by local authorities and by these specifications, to test the mechanical systems.
3. Request for Tests: Notify The Department a minimum of 24 hours in advance of tests. Certify in writing that specified tests have been made in accordance with the specifications.
4. Deficiencies: Immediately correct deficiencies that are evidenced during the tests and repeat tests until system is approved. Do not cover or conceal piping, equipment or other portions of the mechanical installations until satisfactory tests are made and approved.

**1.7 ELECTRICAL WORK**

- A. Provide equipment electrical panels and packaged line voltage control panels listed and labeled by UL, FM, ETL or other approved testing agency. If listing and labeling is not available, stamp the submittal drawings for these panels by a licensed Registered Professional Engineer approved by the Authority Having Jurisdiction, at no additional cost.

**1.8 SPECIAL TOOLS**

- A. Provide three sets of special tools, and testing and monitoring equipment required in other sections of Division 15.

**1.9 WARRANTY**

- A. Warranty workmanship, labor, and materials for a period of one year from the date of final acceptance, without limitation, except where longer warranty periods are specified in a specific section under this Division, or in the General Conditions of the Contract. Promptly coordinate and perform warranty Work at the Contractor's sole expense.

**PART 2 - PRODUCTS - NOT USED**

## **PART 3 - EXECUTION**

### **3.1 LIMITATIONS OF EQUIPMENT DURING CONSTRUCTION**

- A. Cover and protect open ends and individual components of the HVAC systems during construction when dust, dirt, debris, overspray, or other construction potential contaminants could enter the air distribution system or elements, (ducts, fans, VAV boxes, silencers, etc.).
- B. Provide temporary construction filters over return airshaft opens and at air handling unit return air dampers.
- C. Cover ductwork and equipment during storage. Cover end of pipes and ducts during construction.
- D. Provide temporary heating and cooling to maintain the building at 70 degrees F., and temporary ventilation with filtration during construction.

### **3.2 CLEANING AND REPAIR**

- A. Clean and repair existing materials and equipment that remain or are to be reused or are affected by this work.
- B. Plug, patch and repair surfaces, adjacent construction, and finishes damaged during demolition and new work. Restore to original condition or better. Retexture surfaces to match surrounding surfaces. Repaint affected surfaces, with extent of paint to include adjacent surfaces to next wall or other clean break to avoid mismatched finish. Repair fire proofing. Replace damaged ceiling tiles with ones to match existing.

**END OF SECTION 15010**

## SECTION 15075

### MECHANICAL IDENTIFICATION

#### PART 1 - GENERAL

##### 1.1 SUMMARY

A. Section includes:

1. Equipment nameplates.
2. Valve tags and fasteners.
3. Pipe markers.

B. Related Sections:

15010 MECHANICAL GENERAL REQUIREMENTS

##### 1.2 DESCRIPTION

- A. Provide labels and tags for valves and equipment installed under this contract.
- B. Provide labels for piping.

##### 1.3 REFERENCES

- A. ASME A13.1 (American Society of Mechanical Engineers) – Scheme for the Identification of Piping Systems.

##### 1.4 SUBMITTALS

- A. General: Submit product data in accordance with SECTION 15010 - MECHANICAL GENERAL REQUIREMENTS and as further described by this article.
1. Submit written master schedule of equipment, components and systems that will be tagged and labeled for the project.
  2. Include in the schedule, the proposed method of labeling to be implemented (nameplate, tag, marker, etc.), legend ("Domestic Cold Water," "PMP-1," etc.) and letter/background colors.
  3. Match legend to Contract Document legends, abbreviations and schedule symbols. Use standard mechanical identification products when available.
  4. Submit separate proposed "Valve Directories" Include valve designations, a brief description and normal position (open (NO), closed (NC), balanced to X GPM). For Example:

Valve Designator	Description	Normal Position
H-101	BLR-1 Supply Isolation	NO
H-102	BLR-1 Return Isolation	NO

Valve Designator	Description	Normal Position
H-103	BLR-1 Flow Balance	150 GPM
P-100	Domestic Water Service Isolation	NO
P-201	Supply Strainer Flush Valve	NC
ETC.		

## 1.5 CLOSEOUT SUBMITTALS

- A. SECTION 15010 – MECHANICAL GENERAL REQUIREMENTS.
- B. Submit completed typed "Valve Directories" with balance valve settings as obtained from the final balance report.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Marking Services Incorporated (MSI).
- B. Seton Identification Products.
- C. Approved equal.

### 2.2 EQUIPMENT NAMEPLATES

- A. Plastic Engraved Equipment Nameplates:
  - 1. Minimum letter height: 3/4 inch.
  - 2. Tag size: Commensurate with specified lettering requirements. Provide uniform size for similar types of equipment.
  - 3. Thickness: 1/16 inch minimum.
  - 4. Fastening method: Mounting holes. Adhesive backing may be provided for labeling equipment where drilling holes is not feasible with the pre-approval of the Contracting Agency.
  - 5. Color coding: As designated by the Contracting Agency. If specific direction is not provided, select white letters on black background.
  - 6. Legend: As designated by the Contracting Agency. If specific direction not provided, match scheduled equipment symbols.

### 2.3 VALVE TAGS

- A. General:
  - 1. Provide tags for new mechanical system valves provided by the project.
  - 2. Coordinate with existing valve and equipment tag scheme for glycol piping and vavles.



**B. Plastic Engraved Tags:**

1. Round, 1-1/2 inches diameter, engraved plastic.
2. Stamped and filled black with service indicator.
  - a. 1/4 inch service indicator on top.
  - b. 1/2 inch valve number below.
3. Beaded chain tag fasteners.
4. Provide tag color coding to match pipe marker coding or as designated by the Contracting Officer.

**C. Brass Stamped Tags:**

1. Round, 1-1/2 inches diameter, brass with smooth edges.
2. Stamped and filled black with service indicator.
  - a. 1/4 inch service indicator on top.
  - b. 1/2 inch valve number below.
3. Beaded chain tag fasteners.

**D. Valve Chart Frame:**

1. 8-1/2" x 11" aluminum frame with plastic lens.
2. Provide multiple frames as required.

**2.4 PIPE MARKERS**

**A. Color and Lettering: Conform to ASME A13.1.**

**B. Plastic Pipe Markers:**

1. Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering.
2. Larger sizes may have maximum sheet size with spring fastener.

**C. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.**

**PART 3 - EXECUTION**

**3.1 INSTALLATION**

- A. Install identifying devices after completion of coverings and painting.
- B. Do not install identifying devices over factory installed equipment labels.
- C. Provide new equipment nameplates, valve tags and pipe markers for the facilities mechanical systems.
- D. Locate identifying devices in clear view for simple identification.

- E. Small equipment, such as in-line pumps may be identified with tags in lieu of nameplates if inadequate room is available.
- F. Tag automatic controls, instruments, and relays. Key these to control schematic.
- G. Frame and install approved valve directories in the central boiler room and each fan room at a location designated by the Contracting Officer.

### **3.2 PIPE IDENTIFICATION**

#### **A. Pipe Identification:**

1. Identify piping, concealed or exposed. Identify both service and flow direction in accordance with existing piping scheme.
2. Install markers in unobstructed view and aligned with horizontal or vertical axis of piping as appropriate. For piping located above the normal line of vision, place markers below the pipes horizontal centerline for clear unobstructed view from below.
3. Install markers not to exceed 20 foot intervals along straight piping runs (including risers and drops), adjacent to each valve and tee, at each side of a "blind" penetration or obstruction.
4. Pipe labels are not required in public spaces unless specifically indicated.

**END OF SECTION 15075**

## **SECTION 15080**

### **MECHANICAL INSULATION**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

A. Section Includes:

1. This section describes specific requirements, products and methods of execution which relate to the insulation of ducts, fittings, equipment, pipes and other surfaces of the mechanical installation.

B. Related Sections:

15010 MECHANICAL GENERAL REQUIREMENTS

##### **1.2 DESCRIPTION**

- A. Provide thermal insulation with jacket for chilled water, glycol, piping system including valves, equipment and appurtenances.

##### **1.3 REFERENCES**

- A. International Building Code (IBC).
- B. International Mechanical Code (IMC).
- C. ASHRAE Standard 90.1-2004 Energy Standard for Buildings Except Low-Rise Residential Buildings.
- D. NFPA 90A – 2002 Standard for the Installation of Air Conditioning and Ventilating Systems.
- E. NFPA 90B – 2006 Standard for the Installation of Warm Air Heating and Air Conditioning Systems.

##### **1.4 SUBMITTALS**

- A. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.
- B. Qualifications: Submit manufacturer and Applicator qualifications, showing compliance with Article 1.5.

##### **1.5 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years experience.
- B. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years experience.

## **1.6 ENVIRONMENTAL REQUIREMENTS**

- A. Maintain ambient conditions required by manufacturer of each product.

## **PART 2 - PRODUCTS**

### **2.1 FIRE RATING OF MATERIALS**

- A. Provide insulation products used aboveground in building with burning characteristics in compliance with NFPA Standards 90A and 90B: Flame Spread 25, Fuel Contributed 50, Smoke Developed 50. Tested according to UL 723, ASTM E84, or NFPA 255..

### **2.2 FIBERGLASS INSULATION**

- A. Piping: Provide insulation products as follows:
  - 1. Thermal conductivity K equals 0.24 at 100 degrees F. mean temperature. ASTM C335.
  - 2. Factory applied vapor-barrier, flame retardant all service jacket and tape, with permeability rating equals 0.02 perms. ASTM E 96.
  - 3. Temperature limits for fiberglass pipe insulation: 350 degrees F, unless otherwise indicated.
  - 4. Manufacturers: Johns Manville, Owens Corning, Knauf Fiber Glass, or approved equal.

### **2.3 FLEXIBLE FOAM PLASTIC**

- A. Thermal Conductivity: 0.27.
- B. Water Vapor Transmission: 0.08.
- C. Flame-spread rating of 25 or less and a smoke-developed rating of 50 or less as tested by ASTM E 84.
- D. Manufacturer: Armaflex, Aerotube, Rubatex.

### **2.4 CANVAS JACKETING**

- A. Insulating Lagging Canvas: Eight ounces per square yard minimum, fire-retardant material complying with fire ratings specified above. Manufacturer: Chas Harmon "Osnaberg", Claremont Company Inc., "Claretex", or approved equal.
- B. Lagging Adhesive: Plastic synthetic resin emulsion adhesive; watertight, mildew resistant, fire retardant. Manufacturer: Miracle LA69, Borden Aeorbol, Childers Chil-Perm CP or approved equal.

### **2.5 METAL JACKETING**

- A. 27 gauge (U.S. Standard) heavy corrugated aluminum.

- B. Preformed fitting covers.

## **2.6 COATINGS**

- A. Coatings: UL labeled.
- B. On cold or dual service lines, use vapor barrier type coatings.

## **2.7 PREFORMED FITTING COVERS**

- A. One piece premolded PVC jacketing and fitting covers specifically designed for the service intended.
- B. Install per manufacturer's instructions and secure with manufacturer's color matching PVC tape.
- C. Manufacturer: J-M "Zeston", TeeCee, Proto, Certainteed.

## **PART 3 - EXECUTION**

### **3.1 GENERAL**

- A. Do not apply insulation materials until surfaces to be covered are clean and dry and foreign material such as rust, dirt, etc. is removed.
- B. Keep insulation clean and dry during installation and during the application of any finish.
- C. Do not install the insulation on pipe fittings, and pipe joints until the piping is tested and approved.
- D. Do not install the insulation of ducts or fittings until the ductwork has been tested and approved.
- E. Do not apply under conditions of excessive humidity or at temperatures below 50 degrees F. or above 100 degrees F.

### **3.2 PIPE INSULATION**

- A. Piping:
  - 1. Insulate with sectional fiberglass and provide a completely sealed vapor barrier. Provide 1-inch insulation thickness, unless noted otherwise.
  - 2. Insulate valves, fittings, tanks, and air separators, except where indicated.
- B. Refrigeration Piping:
  - 1. Insulate with flexible foam plastic insulation; glue seams with manufacturers recommended cement.

- C. In addition to specified jackets, provide heavy corrugated aluminum jacket on piping insulation anywhere piping is on roof, subject to damage during O & M activities, and where exposed below eight feet zero inches above floor in public areas.

### **3.3 TECHNIQUE FOR APPLICATION TO PIPES**

- A. Close longitudinal joints of pipe insulation firmly and butt insulation sections firmly together. Neatly and smoothly adhere laps and butt strips.
- B. Clean the contact area on jacket for adhesive lap strips and butt strips so it is free from fingerprints, oil, construction dust and other contaminants. Clean surfaces with tack rags, methanol, or other suitable agent before attempting to adhere the strip. Apply pressure to adhesive strip with suitable tool immediately after adhering. Remove insulation with inadequately sealed joints and install new sections. Outwardly clinching staples may be used to reinforce joints.
- C. Continuously seal vapor barriers. If staples are used at laps, seal the entire length of stapled lap with adhesive jacket tape applied as specified above for laps and butts. Sectionalize vapor barrier by sealing ends of insulation sections at not more than 25 feet intervals, to prevent moisture migrating lengthwise. Apply butt strips over joint as above.
- D. Except as indicated, locate pipe hangers and rollers outside insulation. Provide insulation saddles or sheet metal shields, around insulation. On pipes two inches and larger, within the area of each insulation shield, use calcium silicate or cellular glass on the lower half of the insulation, equal in thickness to adjacent insulation.
- E. Where piping is installed outdoors, provide two-layer glass cloth and four-layer weatherproof vapor barrier adhesive coating, in addition to jacket specified.

### **3.4 TECHNIQUE FOR APPLICATION TO PIPE FITTINGS, EQUIPMENT AND VALVES**

- A. Insulate fittings, valves and flanges to the same thickness as the pipe insulation.
- B. Any of the following methods of insulation is acceptable:
  - 1. Blanket Wrap: Wrap the fitting with compressed glass fiber blanket. Wire the blanket securely in place, then cover with a smooth layer of insulating/finishing cement. Cover with glass mesh tape, adhering it with an adhesive coating.
  - 2. Fabricated Segments: Cut mitered segments from pipe insulation that has the same wall thickness as adjacent pipe insulation, to form a cover which will fit snugly around the fitting. Wire the segments firmly in place and seal the joints with insulating/finishing cement. Apply adhesive coating and

wrap with glass mesh tape, then apply another layer of the same coating over the whole assembly.

3. Cement: Apply insulating or insulating/finishing cement, molding it to the contour of the fitting. When area is large apply an under layer of cement, wrap this with glass mesh tape, then apply an outer layer of cement. If the insulation is not concealed, the exposed surface of insulating/finishing cement to have a final glass mesh tape wrap embedded in adhesive.
- C. In each of the listed methods, to protect the insulation against contact damage, apply an adhesive coating when the cement is completely dry and hard, then wrap with glass mesh tape. Apply another coating of adhesive over the whole assembly.
- D. In each of the listed methods, pre-formed fitting covers may be substituted for the tape and adhesive covering specified for inside systems. Cement and tape fitting covers on cold piping to provide a positive vapor barrier.

**END OF SECTION 15080**

## **SECTION 15181**

### **HYDRONIC PIPING AND SPECIALTIES**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

A. SECTION includes:

1. Pipe and fittings for:
  - a. Hydronic cooling piping.
  - b. Equipment drains and overflows.
2. Valves.
3. Piping accessories.
4. Hydronic Specialties:

B. Related Sections:

15010 MECHANICAL GENERAL REQUIREMENTS

##### **1.2 REFERENCES**

- A. International Building Code (IBC).
- B. International Mechanical Code (IMC).

##### **1.3 SYSTEM DESCRIPTION**

A. Design Requirements:

1. This section describes specific requirements, products and methods of execution for the system of liquid heat transfer throughout the project. .
2. Design expansion compensation system to adequately protect piping and structure from thermal expansion and contraction forces.

B. Performance Requirements:

1. Provide performance and output shown or scheduled on drawings.
2. Provide loops, pipe offsets, and swing joints, or expansion joints where required or indicated.
3. Pipes shall be capable of thermal expansion movement without disengagement of supports.
4. Provide structural work and equipment required to control expansion and contraction of piping. Verify that anchors, guides, and expansion joints provided, adequately protect system.



## 1.4 SUBMITTALS

- A. Refer to SECTION 15010 – MECHANICAL GENERAL REQUIREMENTS for general submittal requirements.
- B. Product Data:
  - 1. Submit product literature for items specified in PART 2 and those products required by the performance standards of this SECTION. Literature clearly annotated to indicate specified salient features and performance criteria.
- C. Shop Drawings:
  - 1. Submit shop drawings for performance-specified products and systems.
  - 2. Submit shop drawings for piping systems to demonstrate proper layout and coordination.
  - 3. Provide shop drawings to show system layout and indicate elevation of piping above finish floor.
  - 4. Indicate dimensions and weights of equipment, and placement of openings and holes.
  - 5. Include reference to ductwork and other equipment where space coordination is necessary to avoid conflicts.
  - 6. Indicate mechanical and electrical service locations and requirements.
- D. Quality Assurance/Control Submittals:
  - 1. Design Data: Submit calculations for performance specified products and systems.
  - 2. Certificates, Manufacturer's Instructions, and Manufacturer's Field Reports:
    - a. Provide a complete manufacturer's written installation, operation and maintenance manual for each type of installed equipment. Clearly annotate the manual to indicate applicable information for the specific equipment model(s) installed.
    - b. Included with the manual one copy of the completed start-up and operation checklist. The checklist shall include:
      - 1). Printed names and signatures of the installers.
      - 2). Documentation from Manufacturer's representative and Contracting Agency that the equipment has been properly installed and is fully operational, thus validating the equipment warranty.
  - 3. Provide test reports:
    - a. Provide certificate that cleaning of hydronic systems has been accomplished.
    - b. Provide certificate listing satisfactory results for the hydrostatic tests.

- c. Provide certificate listing satisfactory results for the operational tests.

E. Closeout Submittals:

1. Project Record Documents: Record actual locations of valves, strainers, air vents, flexible pipe connectors, expansion joints, other components, and locations of access doors required for access.
2. Operation and Maintenance (O&M) Manuals:
  - a. Refer to SECTION 15010 – MECHANICAL GENERAL REQUIREMENTS, for O&M Manual formatting requirements and number of copies required.
  - b. Provide copies of approved submittal information for inclusion within the project O&M Manual. Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, parts listings, and spare parts list.
  - c. Provide copies of test reports and certifications in O&M Manual.

## 1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
2. Acceptable Installers: Minimum three years experience in the installation and start-up of hydronic systems and equipment.

- B. Pre-Installation Meetings: Coordinate installation of hydronic systems and equipment with trades responsible for portions of this and any other related sections of the Project Manual prior to installation of any hydronic components.

## 1.6 DELIVERY, STORAGE, AND HANDLING

A. Acceptance at Site:

1. Verify that products are delivered in original factory packaging and are free from damage and corrosion.
2. Remove damaged, or otherwise unacceptable, products from the project site when directed by the Contracting Agency.
3. Accept expansion joints on site in factory packing with shipping bars and positioning devices intact. Inspect for damage.

B. Storage and Protection:

1. Store products outside the general construction zone in covered storage area protected from the elements, until installed.
2. Handle items carefully to avoid breaking, chipping, denting, scratching, or other damage.
3. Replace damaged items with same item in new condition.

## **1.7 WARRANTY**

- A. Refer to Division 1 for general warranty requirements.
- B. Provide manufacturer's warranty for products provided under this section.
- C. Submit necessary documentation to the Manufacturer's Representative to validate manufacturer's warranty.
- D. Provide to the Contracting Agency one copy of warranty documentation and confirmation receipt from the Manufacturer's Representative.

## **PART 2 - GENERAL**

### **2.1 PIPE AND FITTINGS**

- A. Glycol Systems :
  - 1. Copper pipe: Type L copper, wrought copper fittings.
  - 2. Galvanized or steel piping is not permitted.
- B. Equipment drains and overflows: Type L copper pipe, wrought copper fittings.

### **2.2 VALVES**

- A. Select valves of the best quality and type suited for the specific service and piping system used. Minimum working pressure rating 125 psig saturated steam or 200 psig W.O.G. Packing material or seals shall not contain asbestos.
- B. Manufacturers: Crane, Nibco, Hammond, Jenkins, Grinnell, Milwaukee, Stockham.
- C. Ball Valves: Two piece type, full port, bronze body and ball, TFE seats, optional stainless steel body and ball, 150 psig OWG. May be substituted for gate valves except where otherwise indicated.
- D. Gate Valves, two inch and smaller: Bronze body and trim, rising stem, solid wedge. Use only where shown on drawings.
- E. Gate Valves, 2-1/2 inch and three-inch: bronze body and trim, flanged, threaded or sweat fitting. Non-rising stem: Inside screw. Rising stem: OS&Y.
- F. Swing Check Valves: Bronze body, horizontal swing, Y-pattern,
- G. Drain Valves: Full port ball valve with threaded hose adapter with bronze end cap. Do not use sillcocks or butterfly valves as drain valves.
- H. Valves Specified Elsewhere: Provide special valves such as motor-operated valves, relief valves, temperature regulating valves, etc., as specified under the individual system or as indicated on the Drawings.

### **2.3 UNIONS (STANDARD)**

- A. Copper Piping (Sweat and Threaded): Cast brass, ground joint, copper to copper, or copper to threaded joint. Grinnell No. 9730 - 9739.

### **2.4 DIELECTRIC ISOLATORS (ELECTRICALLY INSULATING)**

- A. Provide dielectric flanges.
- B. Insulating gaskets shall be suitable for fluid type, temperature and pressure.
- C. Manufacturers: Capitol, Epco, Control Plastics, Watts, or approved equal.

### **2.5 PRESSURE GAUGES**

- A. Provide where shown on drawings, specified in PART 3, or as required.
- B. Bourdon tube type with 4-1/2-inch dial (minimum) accuracy plus or minus one-percent span, recalibratable. Normal operating pressure near midpoint of range. Industrial quality.
- C. Gauge cock on gauges and pulsation damper (snubber).
- D. Differential pressure gauges shall be piston or diaphragm type with range suitable for application and static pressure capability suitable for system pressure. Orange Research.

### **2.6 THERMOMETERS**

- A. Provide where shown on drawings, specified in PART 3, or as required.
- B. Dial Type: Industrial quality three-inch dial with 270 degrees (minimum) scale length. Straight, angle or remote as necessary for visibility.
- C. Normal operating temperature at scale midpoint and sufficient range to comfortably cover operating conditions.
- D. Provide separable wells of suitable material for piping and mounting hardware for ducts. Set probe in heat transfer paste recommended by thermometer manufacturer.
- E. Manufacturers: Terice, Marsh, Weksler, or approved equal.

### **2.7 PRESSURE AND TEMPERATURE TEST PLUGS**

- A. Provide where shown on drawings, specified in PART 3 or as required.
- B. Standard type for 1/8-inch diameter pressure or temperature probes. Self seal when probe removed and complete with threaded cap. Minimum continuous rating 125 psig and 220 degrees F. coincident. Sealing element suitable for fluid in pipe.

- C. Provide one thermometer and one pressure gauge for each range required by system parameters.
- D. Manufacturers: Sisco, Peterson Equipment, or approved equal.

## **2.8 AIR VENTS**

- A. Coin operated vent: Manual low profile vent for use in baseboard and other enclosures where automatic vent will not fit. 150 PSIG working pressure, 212 degrees F. operating temperature. Bell & Gossett No. 4V or approved equal.
- B. Float Type:
  - 1. Brass or semi-steel body, copper, polypropylene, or solid non-metallic float, stainless steel valve and valve seat; suitable for system operating temperature and pressure; with isolating valve.
  - 2. Operating pressure 75 psig, hydrostatic pressure 200 psi maximum, intended for use in hot or cold lines. Provide ball type isolation valves for air vents.
  - 3. Manufacturers: Hoffman No. 79, or equal.

## **2.9 STRAINERS**

- A. Size two inch and under:
  - 1. Screwed brass or iron body for 175 psig working pressure.
  - 2. Y pattern with 1/32-inch stainless steel perforated screen.
- B. Size 2-1/2 inches to four inches:
  - 1. Flanged iron body for 175 psig working pressure.
  - 2. Y pattern with 3/64-inch stainless steel perforated screen.
- C. Manufacturers: Metraflex, Armstrong, Crane, Hayward, Watts Regulator, Hoffman, Sarco.

## **2.10 BALANCING VALVES**

- A. Provide calibrated plug or ball valve type balancing valves with self-sealing quick connect pressure taps, scale and locking device. Include schedule with submittal.
- B. Manufacturers: Bell & Gossett, Taco, or equal.

## **2.11 RELIEF VALVES**

- A. Bronze body, Teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, capacities ASME certified and labeled.
- B. Manufacturers: Watts Regulator, or equal.

## **2.12 FLUSHING AGENT**

A. Synthetic organic dispersant:

1. Manufacturer: CH2O, Product 6149 or approved equal.

## **2.13 WATER TREATMENT**

A. Hydronic loop treatment:

1. Manufacturer: CH2O, Product 6439 or approved equal.

## **2.14 GLYCOL SYSTEMS**

A. Provide equipment and products specifically designed and approved for continuous operation with the glycol solution.

B. Glycol Solution:

1. Inhibited glycol solution premixed to 50 percent by volume for use with hydronic cooling systems to match existing; quantity to fill complete system.
2. Inhibitor solution to bring solution to glycol manufacturer's recommended inhibitor level for new solutions, after acceptance and final testing, adjusting and balancing.
3. Glycol solution to be tested for glycol percent and inhibitor levels and measured against manufacturer's recommendations.
4. Submitted written certification glycol solution meetings manufacturer's recommendations before substantial completion is requested.

## **PART 3 - PRODUCTS**

### **3.1 PREPARATION**

- A. Protection: Cover equipment and plug piping connections to protect components from construction dirt and debris.

### **3.2 INSTALLATION**

- A. Install products in accordance with manufacturer's instructions.
- B. Provide finished products with protective covers during balance of construction.
- C. Provide accessible ball type isolation valves at major piping branches, and on main lines as shown, and at terminal devices. Provide drains and manual vents at main line and branch line valves to facility draining and filling piping sections.
- D. Install balancing valves and automatic flow limiting valves to be accessible and adjustable.

- E. Install piping to maintain headroom, conserve space, and not interfere with use of space.
- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- G. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
- H. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
- I. Provide test plugs on both inlet and outlet sides of heat transfer elements to allow measurement of both fluid pressure drop and differential temperature.
- J. Install flexible pipe connectors on pipes connected to equipment supported by vibration isolation. Provide line size flexible connectors.
- K. Install flexible connectors at right angles to displacement. Install one end immediately adjacent to isolated equipment and anchor other end. Install in horizontal plane unless indicated otherwise.
- L. Provide support and equipment required to control expansion and contraction of piping. Provide loops, pipe offsets, and swing joints, or expansion joints where required.
- M. Provide pipe anchors offsets, loops and expansion compensators as required to control the expansion of pipelines.

### **3.3 CONSTRUCTION**

- A. Interface with other Work:
  - 1. Coordinate and sequence installation of hydronic products with trades responsible for portions of this and other related sections of the Project Manual.
  - 2. Rework required as a result of failure to follow the manufacturer's written installation instructions or to properly coordinate with related Work shall be completed at no additional expense to the Owner.

### **3.4 REPAIR/RESTORATION**

- A. Repair any product components broken during installation or startup with replacement parts supplied by the product manufacturer.
- B. Substitute replacement parts from other manufacturers are not acceptable.
- C. Touch-up finished surfaces with touch-up paint provided by the equipment manufacturer.

### **3.5 FIELD QUALITY CONTROL**

**A. Hydronic System Cleaning and Treatment Coordination Meeting:**

1. Conduct a meeting prior to flush cleaning and treatment of the hydronic system to discuss cleaning agents, treatment chemicals and procedures to be used. Discuss system fill procedures with glycol solution.
2. Participants shall include the Contractor, Subcontractor directly performing the work and the Owner's Maintenance Staff personnel.
3. Provide one week notice prior to the meeting.
4. Cleaning, filling and treatment of the hydronic system is not permitted until this coordination meeting has been conducted and the Contracting Agency's concerns have been adequately addressed.

**B. Site Tests:**

**1. Hydrostatic Pressure Test:**

- a. Fill hydronic system is with clean operating fluid. Hydrostatically test system to 100 psig. System must hold test pressure for a two hour period with no pressure drop to pass test.
- b. Inspect system during test and repair leaks.
- c. Provide written certification indicating that the pressure test has been satisfactorily completed.

**2. Operational Test:**

- a. Inspect system for proper fluid circulation, sufficient clearance for expansion and contraction of piping and proper system pressure control.
- b. Note and correct discrepancies and deficiencies.
- c. Provide written certification that the operational test has been satisfactorily completed.

3. Test results shall be certified in writing. Include dates and sections tested, test pressure, test duration, printed names and signatures of person performing the test and Contracting Agency witnessing the test.

**C. Inspection:** Arrange for inspections and provide notice to the Contracting Agency when the entire work or logical portions thereof, is ready for inspection.

### **3.6 ADJUSTING**

- A.** Adjust functional components for proper operation in accordance with manufacturer's recommendations, or as otherwise directed.
- B.** Coordinate and work directly with the Balancing and Testing Agency to provide systems in proper operating order.



- C. Make corrections and adjustments in a timely manner as required by the Balancing and Testing Agency.

### **3.7 CLEANING**

- A. Clean internal surfaces of the completed hydronic system.
- B. Exercise proper care during flushing and cleaning of systems to make sure no damage is done to equipment, valves, fittings, or Work of other trades. Restore damaged system components or Work of other trades to new or original condition at no additional cost to Owner.
- C. After construction is completed, clean and wipe down exposed surfaces of pumps, piping and appurtenances.

### **3.8 DEMONSTRATION & START-UP**

- A. Start-up and operate hydronic systems and equipment in accordance with the manufacturer's written installation and operation manual checklist.
- B. Document start-up and operational checks using the checklist and submit in accordance with submittal requirements.

**END OF SECTION 15181**

## **SECTION 15182**

### **HVAC PUMPS AND EQUIPMENT**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

A. SECTION Includes:

1. Base mounted pumps, dry cooler, controls and accessories.

B. Related Sections:

1. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

15010 MECHANICAL GENERAL REQUIREMENTS

##### **1.2 REFERENCES**

- A. NFPA 70 – National Electrical Code.
- B. UL 778 – Motor Operated Water Pumps.

##### **1.3 SYSTEM DESCRIPTION**

- A. Provide glycol cooling system shown, including but not limited to, dry cooler, Lead/Standby pumps, piping, cooling system controls and accessories. System shall be complete and fully operational and interface with existing cooling equipment located in basement.
- B. Provide performance and output shown or scheduled on drawings.
- C. Provide performance based cooling system control panel for fully operational cooling system which shall include features to sequence lead and standby pumps and dry coolers, local exterior mounted control panel with H-O-A switches for all equipment, operating indication lights and alarms with common alarm auxiliary contact for building automation system.

##### **1.4 SUBMITTALS**

- A. Refer to SECTION 15010 – MECHANICAL GENERAL REQUIREMENTS for general submittal requirements.
- B. Product Data:
1. Provide manufacturers' product literature, clearly annotated to indicate specified salient features and performance criteria.

2. Include the following:

- a. Catalog data and performance sheets for each pump, dry cooler and control panel scheduled. Indicate which model and all options that are being submitted.
- b. Certified pump curves showing performance characteristics with pump and system operating point plotted. Include NPSH curve when applicable.
- c. Dimensional, weight and center of gravity data. Provide lifting "pick-points" for dry cooler.
- d. Features and appurtenances provided, clarify if items are as specified.
- e. Electrical characteristics and connection requirements. Include control panel front and interior layout with electrical schematic and ladder logic diagram of cooling system controller for specific installation.
- f. Sequence of operations for complete cooling system; include start-up, shut down, lead/standby pump operations, dry cooler operations, alarms and trouble conditions and resets for the above conditions.

C. Shop Drawings:

1. Submit fully dimensioned shop drawings with required clearances identified.
2. Control panel drawings shall include components with specific usage and characteristics identified.
3. Indicate mechanical and electrical service locations and requirements.

D. Quality Assurance/Control Submittals:

1. Design Data and Test Reports: Provide design data and test reports for each pump.
2. Certificates, Manufacturer's Instructions, and Manufacturer's Field Reports:
  - a. Provide a complete manufacturer's written installation, operation and maintenance manual for each installed pump. Clearly annotate the manual to indicate applicable information for the specific equipment model(s) installed.
  - b. Included with the manual one copy of the completed start-up and operation checklist. The checklist shall include:
    - 1). Printed names and signatures of the installers.
    - 2). Documentation from Manufacturer's representative and Contracting Agency that the pumps have been properly installed and is fully operational, thus validating the equipment warranty.

**E. Closeout Submittals:**

1. **Project Record Documents:** Record actual locations of dry cooler, control panel, pumps and associated valves, and areas required for maintenance access.
2. **Operation and Maintenance (O&M) Manuals:**
  - a. Refer to SECTION 15010 – MECHANICAL GENERAL REQUIREMENTS, for O&M Manual formatting requirements and number of copies required.
  - b. Provide copies of approved submittal information for inclusion within the project O&M Manual. Include manufacturer's descriptive literature, operating instructions, installation instructions, assembly views, lubrication instructions, maintenance and repair data, parts listings, and spare parts list.

**1.5 QUALITY ASSURANCE**

**A. Qualifications:**

1. **Manufacturer Qualifications:** Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
2. **Acceptable Installers:** Minimum three years experience in the installation and start-up of pumps.

**B. Pre-Installation Meetings:** Coordinate installation of pumps and associated piping and valves with trades responsible for portions of this and any other related sections of the Project Manual prior to installation of any components.

**C. Regulatory Requirements:** Products Requiring Electrical Connection – Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

**1.6 DELIVERY, STORAGE, AND HANDLING**

**A. Acceptance at Site:**

1. Verify that products are delivered in original factory packaging and are free from damage and corrosion.
2. Remove damaged, or otherwise unacceptable, products from the project site when directed by the Contracting Agency.

**B. Storage and Protection:**

1. Outside the general construction zone, store products in covered storage area protected from the elements until installed.
2. Handle items carefully to avoid breaking, chipping, denting, scratching, or other damage. Replace damaged items with same item in new condition.

## **1.7 WARRANTY**

- A. Provide one year manufacturer's warranty.
- B. Submit necessary documentation to the Manufacturer's Representative to validate manufacturer's warranty.
- C. Provide to the Contracting Agency one copy of warranty documentation and confirmation receipt from the Manufacturer's Representative.

## **PART 2 - PRODUCTS**

### **2.1 DRY COOLER**

- A. Provide unit capable of rejecting heat form glycol solution as scheduled on drawings.
- B. Provide fans, housing, mounting frame, controls and appurtenances as scheduled and required for complete installation and operations.
- C. Unit and controls shall be match existing equipment for compatibility and operations without special or third party interfaces.
- D. Provide and coordinate with control panel operating and trouble indicating lights for each dry cooler, and common alarm auxiliary contact for building automation system.

### **2.2 BASE MOUNTED PUMPS**

- A. Type: Lead and Standby base mounted, single stage, end suction design with a foot mounted volute to allow servicing of the impeller and bearing assembly without disturbing piping connections.
- B. Materials:
  - 1. Casing: Cast iron case, with suction and discharge gage ports, renewable bronze casing wearing rings, seal flush connection, drain plug, flanged suction and discharge.
  - 2. Impeller: Bronze, fully enclosed, keyed to shaft.
  - 3. Bearings: Permanently lubricated roller or ball bearings.
  - 4. Shaft: Alloy steel with copper, bronze, or stainless steel shaft sleeve.
  - 5. Seal: Carbon rotating against a stationary ceramic seat, 225 degrees F. maximum continuous operating temperature.
  - 6. Base plate: Structural steel or fabricated steel channel with fully enclosed sides and ends, and securely welded cross members.
- C. Drive: Flexible coupling with coupling guard.
- D. Performance:
  - 1. As scheduled.
  - 2. Maximum working temperature: 225 degrees F.

3. Maximum working pressure: 175 psig.
- E. Electrical Characteristics:
1. As scheduled.
  2. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70.
  3. Coordinate with Division 16 requirements; coordinate disconnect for each pump.
- F. Provide and coordinate with control panel operating and trouble indicating lights for each pump, and common alarm auxiliary contact for building automation system.
- G. Manufacturers: Bell and Gossett, Taco, Flowserve.

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. Protection: Cover pumps and plug piping connections to protect pumps from construction dirt and debris.
- B. Preparation: Prior to installation of pumps, verify that electrical power is available and of the same voltage and phase characteristics as the pump being installed. Coordinate electrical disconnect for each motor which allows removal of one pump while other pump is operating via the control panel.

#### **3.2 INSTALLATION**

- A. Install pumps, pump supports, suction guides, mechanical seal piping, pressure gauges and other pump appurtenances in accordance with the manufacturer's written installation instructions.
- B. Provide access space around pumps for service. Modify existing pump enclosure for installation of pumps and piping; ensure enclosure is weather tight. .
- C. Decrease from line size with long radius reducing elbows or reducers. Support piping adjacent to pump such that no weight is carried on pump casings.
- D. Provide line sized shut-off valves and line sized soft seat check valve.
- E. Provide air cock and drain connection on horizontal pump casings.
- F. Check, align, and certify alignment of base mounted pumps prior to start-up.
- G. Lubricate pumps before start-up.

### **3.3 CONSTRUCTION**

#### **A. Interface with Other Work:**

1. Coordinate and sequence installation of control panel, dry cooler, pumps and appurtenances with trades responsible for portions of this and other related sections of the Project Manual.
2. Rework required as a result of failure to follow the manufacturers written installation instructions or to properly coordinate with related Work shall be completed at no additional expense to the Owner.

### **3.4 REPAIR/RESTORATION**

- A. Repair any product components broken during installation or startup with replacement parts supplied by the product manufacturer.
- B. Substitute replacement parts from other manufacturers are not acceptable.

### **3.5 FIELD QUALITY CONTROL**

#### **A. Manufacturer's Field Services:**

1. After completion of the installation, a qualified representative of the control panel, dry cooler and pump manufacturer shall conduct start-up and written certification.
2. Start-up and adjust the system to within the tolerances as specified by the equipment manufacturer. Verify pump impellers rotate in the correct direction.
3. Provide two hours operating instruction to authorized Owner's Representative.
4. Test pump, dry cooler and control panel operation and sequencing in accordance with the manufacturer's written installation and testing instructions; include interface to existing equipment in basement.
5. Submit a letter of certification indicating that the pumps, dry coolers and control panel installation and start-up has been completed, that all equipment is properly adjusted and operating within the tolerances as specified by the manufacturer, and that the sequence of operation is fulfilled.

### **3.6 ADJUSTING**

- A. Coordinate and work directly with the Testing, Adjusting and Balancing Agency to provide systems in proper operating order. Make corrections and adjustments as required by the Balancing and Testing Agency in a timely manner.

### **3.7 CLEANING**

- A. After construction is completed, clean and wipe down exposed surfaces of dry coolers, pumps, piping and appurtenances.

- B. Touch up marred or scratched factory finished surfaces using finish materials furnished by manufacturer.

### **3.8 DEMONSTRATION & START-UP**

- A. Start-up and operate complete cooling system in accordance with the manufacturer's written installation and operation manual checklist.
- B. Document start-up and operational checks using the checklist and submit in accordance with submittal requirements.

**END OF SECTION 15182**



**SECTION 15900**  
**BUILDING AUTOMATION SYSTEM**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. SECTION Includes:
  - 1. The requirements for interfacing with packaged cooling pump system controls on this Project.
- B. Related Sections:
  - 15010 MECHANICAL GENERAL REQUIREMENTS

**1.2 DESCRIPTION**

- A. Provide conduit, conductors and interface from roof mounted pump controller panel auxiliary alarm contact to the building automation system.

**1.3 REFERENCES**

- A. NFPA Standard 70, National Electrical Code.

**1.4 QUALITY ASSURANCE**

- A. Qualifications:
  - 1. Acceptable Installers/Programmers:
    - a. Minimum three (3)-years experience in the installation and programming of direct digital control systems.

**1.5 SUBMITTALS**

- A. Refer to 15010 - MECHANICAL GENERAL REQUIREMENTS.
- B. Product Data: Provide manufacturers' product literature.
- C. Closeout: Submit control schematic, points list, and alarm notification summary.

**PART 2 - PRODUCTS**

**2.1 CONTROL CONDUCTORS AND CONDUIT**

- A. Equipment and materials to meet requirements of Division 16, NEC and Department's requirements.

**PART 3 - EXECUTION**

**3.1 WIRING METHODS**

- A. Low voltage wiring shall be in conduit.
- B. Wiring methods shall be in accordance with the requirements of applicable codes and criteria as indicated in Division 16.

- C. Control wiring and AC power wiring shall not share the same conduit nor shall they occupy the same enclosure unless an appropriate grounded metallic barrier is installed between these wiring types.
- D. Label or code each field wire at each end using Ray-Chem or equal heat shrink markers. Permanently label or code each point of all field terminal strips to show the instrument or item served. Color coded cable with cable diagrams may be used to accomplish cable identification.
- E. Splices shall not be made in shielded wiring except where specifically approved. Splices shall be made on terminal blocks in approved junction boxes. Outlet boxes shall not be used for splices.
- F. Provide power to the equipment from a source(s) compatible with the load and acceptable to the Department.

### **3.2 INSTALLATION**

- A. The exact location (point of measurement or control) of all sensing and control devices shall be assigned by the Contractor and submitted for review and approval.
- B. Assign location of circuitry, transmitters, connectors, terminal strips, conduit, wiring and any other instrumentation. Arrange all piping, supports and braces to provide unobstructed access to equipment, valves, drives, controls and items requiring maintenance. Provide a neat and finished appearance.
- C. Fasten all equipment securely. Install equipment and piping parallel to building lines, plumb or level.

### **3.3 COORDINATION**

- A. Coordinate with cooling pump control equipment for common alarm auxiliary contact location and termination requirements.

**END OF SECTION 15900**

**SECTION 16010**  
**ELECTRICAL GENERAL REQUIREMENTS**

**PART 1 - GENERAL**

**1.1 DESCRIPTION AND RELATED WORK**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications Sections, apply to this Section.
- B. This Section applies to all Division 16 and is part of all other Division 16 Sections.
- C. Index of Electrical Specifications:
  - 16010 Electrical General Requirements
  - 16050 Basic Materials and Methods
  - 16111 Conduit and Fittings
  - 16120 Wire and Cable
  - 16131 Outlet Boxes
  - 16132 Pull and Junction Boxes
  - 16140 Wiring Devices
  - 16190 Supporting Devices
  - 16440 Disconnects
  - 16450 Grounding
  - 16460 Secondary Transformers
  - 16470 Panelboards
  - 16471 Transient Voltage Surge Suppression
  - 16475 Overcurrent Protective Devices
  - 16485 Motor Starters
  - 16745 Telecommunications Distribution System
  - 16747 Telecommunications Optical Fiber Distribution
  - 16749 Local Area Network
  - 16995 Electrical Commissioning
  - 16997 Electrical Functional Testing Requirements
  - 16998 Electrical Prefunctional Exams

**1.2 SCOPE**

- A. Provide all labor, products and services required for the complete installation, checkout, and startup of all systems shown and specified.

- B. Where the work of several crafts is involved, coordinate all related work to provide each system in complete and in proper operating order.
- C. Cooperate with all others involved in the project, with due regard to their work, to promote rapid completion of the entire project.
- D. Local Conditions: The Contractor shall thoroughly familiarize himself with the work as well as the local conditions under which the work is to be performed. Schedule work with regard to seasons, weather, climatic conditions, and all other local conditions, which may affect the progress and quality of the work.
- E. Demolition: Coordinate all related demolition in support of the project whether or not such requirements are described on the Drawings. Restore circuits and systems, which are to remain, but which are affected in any way by demolition Work. Conduct a site visit prior to bid to determine Scope. Refer to Part 3 of this Section for execution requirements.
- F. Provide commissioning services as specified in Sections 01650 – Commissioning Requirements and 16995 – Electrical Commissioning.

### **1.3 CODES AND STANDARDS**

- A. Codes: Perform all work in strict accordance with all applicable national, state and local codes; including, but not limited to the latest legally enacted editions of the following specifically noted requirements:
  - 1. NFPA 70, National Electrical Code – NEC.
  - 2. ANSI-C2, National Electrical Safety Code – NESC.
  - 3. International Building Code – IBC.
  - 4. International Fire Code – IFC.
  - 5. Underwriters Laboratory (UL) or approved equal.
- B. Standards: Reference to the following standards infers that installation, equipment and material shall be within the limits for which it was designed, tested and approved, in conformance with the current publications and standards of the following organizations:
  - 1. American National Standards Institute – ANSI.
  - 2. American Society for Testing and Materials – ASTM.
  - 3. American Society of Heating Refrigerating and Air Conditioning Engineers – ASHRAE (Standard 90-75).
  - 4. Institute of Electrical and Electronics Engineers – IEEE.
  - 5. Insulated Cable Engineers Association – ICEA.
  - 6. National Electrical Manufacturers' Association – NEMA.
  - 7. National Fire Protection Association – NFPA.

### **1.4 SPECIFICATION TERMINOLOGY**

- A. "Contracting Agency" is the THE DEPARTMENT as defined in the General Conditions of the Contract.
- B. Streamlining: In many instances, the products, reference standards, and other itemized specifications have been listed without verbiage. In these cases, it is

implied that the Contractor shall provide the products and perform in accordance with the references listed.

- C. "Provide" means furnish all products, labor, subcontracts, and appurtenances required and install to a complete and properly operating, finished condition.
- D. "Furnish" means to purchase material as shown and specified, and cart the material to an approved location at the site or elsewhere as noted or agreed, to be installed by supporting crafts.
- E. "Install" means to set in place and connect, ready for use and in complete and properly operating finished condition, material that has been furnished.
- F. "Rough-in and connect" means provide an appropriate system connection such as conduit with junction boxes, wiring, switches, disconnects, etc., and all wiring connections. Equipment furnished is received, uncrated, assembled, and set in place under the Division in which it is specified.
- G. "Accessible" means arranged so that an appropriately dressed man, 6 feet-2 inches tall, weighing 250 pounds, may approach the area in question with the tools and products necessary for the work intended, and may then position himself to properly and safely perform the task to be accomplished, without disassembly or damage to the surrounding installation.
- H. "Serviceable" means arranged so that the component or product in question may be properly removed, and replaced without disassembly, destruction or damage to the surrounding installation.
- I. "Product" is a generic term, which includes materials, equipment, fixtures, and any physical item used on the project.
- J. "Basis of Design" refers to products around which the design was prepared. Some or all of the particular characteristics of Basis of Design products may be critical to the fit or performance of the completed installation. Such characteristics are often subtle. Where substitutions are made to products that are the Basis of Design, the Contractor is alerted that nominally acceptable substitutions may produce undesirable side effects such as switchboards that no longer fit the space due to increased product dimensions. The Contractor is responsible for resolving all impacts of substitutions. Approval of a substitution request does not relieve the Contractor of complying with the design intent and all Codes.
- K. "As Specified" denotes a product, system, or installation that:
  - 1. Includes all of the salient characteristics identified in the Drawings and Specifications;
  - 2. Meets all of the requirements of the "Basis of Design"; and
  - 3. Is produced by a manufacturer listed as acceptable on the Drawings or in the Specifications.
- L. "Substitution" is a product, system or installation that is not by a listed manufacturer or does not conform to all salient characteristics identified in the Contract Documents, but which the Contractor warrants meets all specific requirements listed in the Contract Documents.

- M. "System Drawing" is a diagrammatic engineered drawing that shows the interconnection and relationship between products to demonstrate how the products interact to accomplish the function intended. Examples of system drawings include control and instrumentation diagrams, and wiring diagrams. Some drawings, such as dimensioned and complete Fire Protection Drawings may be both System Drawings and Shop Drawings.
- N. "Shop Drawings" are dimensioned working construction drawings drawn to scale to show an entire area of work in sufficient detail to demonstrate service and maintenance clearances and complete coordination of all trades.
- O. Reference to a specific manufacturer's product (even as "Basis of Design") does not necessarily establish acceptability of that product without regard to compliance with all other provisions of these specifications.

### **1.5 DRAWINGS, SPECIFICATIONS AND SYMBOLS**

- A. The drawings and specifications are complementary. Do not scale the drawings. Locations of devices, fixtures, and equipment are approximate unless dimensioned.
- B. The drawings are partly diagrammatic and do not show precise routing of conduits or exact location of all products, and may not show in minute detail all features of the installation; however, provide all systems complete and in proper operating order.
- C. Drawing symbols used for basic materials, equipment and methods are commonly used by the industry. Special items are identified by a supplementary list of graphical illustrations, or called for on the drawings or in the specifications.

### **1.6 PRODUCT AND SYSTEM SUBMITTALS**

- A. Submittals: Provide submittals for all products and systems described in Division 16 and shown on the drawings to demonstrate compliance with the requirements of the project. Unless specified otherwise in Division 1, submit data not later than 60 days after award of contract or, in any case, to allow sufficient time for review without delaying construction. Furnish equipment submittals in the manner described elsewhere in these specifications. In addition, include data for review, and organize data, as noted below:
  - 1. Specification reference and/or drawing reference for which literature is submitted for review with an index, following specification format, and item by item identification.
  - 2. Manufacturer's name and address, and supplier's name, address and telephone number.
  - 3. Catalog designation or model number.
  - 4. Rough-in data and dimensions.
  - 5. Operation characteristics.
  - 6. Wiring diagrams for the specific system.
  - 7. Coordination data to check protective devices.

8. All information required to verify compliance with the short-circuit withstand and interrupting ratings, as shown on the Drawings or further stated in these Specifications.
  9. Working construction drawings (shop drawings).
  10. A customized listing of the characteristics identified in the Contract Documents. Indicate whether each item is submitted as "Basis of Design", "As Specified" or "Proposed Substitution". Clearly indicate on product data sheets the data which show the product meets the requirements. Indicate all deviations and mark out all non-applicable items.
  11. ALL PROPOSED SUBSTITUTIONS, DEVIATIONS, MODIFICATIONS, OR CHANGES OF ANY TYPE WHATSOEVER FROM THE PRODUCTS OR SYSTEMS SPECIFIED SHALL BE CLEARLY ITEMIZED IN THE SUBMITTAL INDEX. Submittal approval will not include such deviations unless they are specifically itemized and approved. Where deviations of substitute product or system performance have not been specifically noted in the submittal by the Contractor and accepted by the Contracting Agency, provision of a complete and satisfactory working installation of equal quality to system specified is the sole responsibility of the Contractor. Unapproved deviations discovered in the field shall be corrected as directed by the Contracting Agency.
  12. DELETE ALL SUPERFLUOUS INFORMATION FROM SUBMITTAL DATA SUCH AS MODEL NUMBERS AND OPTIONS FOR EQUIPMENT CONTAINED ON MANUFACTURER'S DATA SHEETS BUT NOT USED ON THIS PROJECT.
  13. Submittals not completely marked as indicated above, in the opinion of the Engineer, will be rejected without review.
- B. Coordination:
1. The Contractor shall utilize the master submittal log provided by The Department for all items submitted in Division 16. Submit master submittal log with first submittal.
  2. Prior to submission for approval, the Contractor shall hold a meeting of all trades to review all shop drawings and submittals. All trades shall cross-check all shop drawings and submittals for conflicts, clearances, physical space allocation and routing, discrepancies, dimensional errors, omissions, contradictions, departures from the Contract requirements, correct electrical/mechanical services and connections, and provisions for commissioning.
  3. The Contractor shall revise, correct, and appropriately annotate all submittals prior to submission for approval.
- C. A current copy of all approved submittals and the submittal log shall be kept at the job site.

- D. With prior permission from the Contracting Agency, partial submittals will be considered for review provided that they are complete sections, as listed below:
  - 1. Individual Special Systems (Telecom, etc.)
  - 2. Raceways, Fittings, and Supports.
  - 3. Panels and Transformers
  - 4. Motor controls and disconnects
  - 5. Cable Trays.
  - 6. Low Voltage Systems.
- E. Mark submittal literature and shop drawings clearly and bind 8-1/2 by 11 inch literature in three-ring hardback loose-leaf binders by individual sets.
- F. Submittal review is for general design and arrangement only and does not relieve the Contractor from any of the requirements of the Contract Documents. Submittals will not be checked for quantity, dimension, fit or proper technical design of manufactured equipment.

#### **1.7 SHOP DRAWINGS REQUIRED**

- A. The Contract Documents are not intended for nor are they suitable for use as shop drawings. Do not use Contract Drawings for direct fabrication or installation of products or equipment; instead, prepare shop drawings for installation and arrangement of work. Submit shop drawings as requested, specified, or otherwise required demonstrating proper planning for installation and arrangement of all work to the satisfaction of the Contracting Agency. Lay out drawings to scale and show dimensions where accuracy of location is necessary for coordination or communication purposes. Scale shall be appropriate to clearly show all aspects of installation and equipment arrangement. Show work of all trades, including Architectural, Structural, Mechanical, and Electrical items which are pertinent to proper and accurate coordination and conflict resolution.
- B. In all cases where one or more equipment items in a mechanical or electrical room or space differ in dimensions or configuration from Basis of Design equipment, the working drawing shall show the entire area. The drawing shall be dimensioned to indicate that required aisle ways and maintenance clearances are being maintained to at least the degree shown on the Contract Drawings.
- C. Provide shop drawings for all products, systems, system components, and special supports that are not a standard catalog product and which may be fabricated for the Contractor or by the Contractor. In addition provide shop drawings for:
  - 1. All electrical and telecommunications rooms and spaces affected by work under this Contract, including all equipment. Demonstrate all required clearances and working spaces are provided.
  - 2. Routing and interdisciplinary coordination of all conduits.
  - 3. Cable Trays.



- 4. Telecommunications room equipment rack elevations.
- D. Prepare shop drawings using the latest release of AutoCAD.
- E. Record Shop Drawings: Provide a copy of the final, corrected, approved shop drawings for the project, updated to show as-built conditions. Drawings shall indicate exact device locations and conduit and wire routing. Prepare drawings using the latest release of AutoCAD and deliver files to the Contracting Agency. Refer to other specification sections for additional system specific requirements.

## **1.8 PERMITS, TESTS AND INSPECTIONS**

- A. Schedule, obtain, and pay for all permits and fees required by local authorities and by these specifications.
- B. Request for Tests: Notify the Contracting Agency a minimum of 72 hours in advance of tests. In the event the Contracting Agency does not witness the test, certify in writing that all specified tests have been made in accordance with the specifications.
- C. Deficiencies: Immediately correct all deficiencies that are evidenced during the tests and repeat tests until system is approved. Do not cover or conceal electrical installations until satisfactory tests are made and approved.
- D. Operating Tests: Upon request from the Contracting Agency, place the entire electrical installation and/or any portion thereof, in operation to demonstrate satisfactory operation.

## **1.9 IDENTIFICATION**

- A. Equipment Labels and Nameplates:
  - 1. Provide rigid engraved labels and nameplates of 1/16 inch thick laminated plastic.
    - a. Label and Nameplate Colors:
      - 1). Normal Equipment: White letters on a black or gray background (engraved labels).
      - 2). Emergency Equipment: White letters on a red background.
      - 3). Standby Equipment: Black letters on a yellow background.
    - b. Securely attach labels with threaded fasteners or pop-rivets. (Adhesive attachment not acceptable.)
    - c. Temporary markings not permitted on equipment. Repaint trims, housings, etc., where markings cannot be readily removed. Refinish defaced finishes.
    - d. No labeling abbreviations will be permitted without prior approval.
  - 2. Include item designation and branch circuit designation (panel and circuit number) on disconnects, starters, equipment and device nameplates, e.g., "FAN #4, Circuit LA-30").

3. Label and Nameplate Locations:
  - a. Provide 1/2 inch minimum height letters on following equipment:
    - 1). Secondary feeder breakers in distribution equipment. Designation as required by load served.
    - 2). Special equipment housed in cabinets, as designated on plans, on outside of door.
    - 3). Equipment housed in CCTV equipment cabinets, as designated on plans, on inside of cabinet door.
    - 4). Equipment housed in ACS equipment cabinets, as designated on plans, on outside of cabinet door (DBC enclosures and DBC Interface Termination Box) or on inside of cabinet door (ACS equipment cabinets).
    - 5). Panelboards as designated on plans, on outside of door.
  - b. Provide 1/4-inch minimum height letters on:
    - 1). Disconnects and starters for motors or fixed appliances.
    - 2). Designated electrical equipment.
  - c. Provide 1/8-inch minimum height, engraved device plates on switches and receptacles where item controlled is not visible from the switch, or as noted on drawings.
  - d. Engrave branch circuit designation (panel and circuit number) on receptacle and light switch device plates, e.g., "81NPA-30"). Verify final panel designations with Contracting Agency prior to engraving nameplates.
  - e. Provide 1/8-inch minimum height letters on lighting control relays, dimmer controls and remote lighting control equipment.
  - f. External Power Sources: Provide 1/8-inch white letters on red background on all starters or controllers that receive power from an external source that is not de-energized by operating the associated disconnecting means.
- B. Branch Circuit Panelboard Directories: Provide neatly typed schedule (odd numbered circuits on left side or top, even on right side or bottom) under plastic jacket or protective cover to protect the schedule from damage or dirt. Securely mount on inside face of panelboard door. Define briefly, but accurately, nature of connected load (i.e., Lighting Room 2989, Receptacles Janitor Room, Etc.) as approved. Sequentially numbered schedules shall not be used.
- C. Empty Conduits: Provide tags with typed description of purpose, and location of opposite end, wired to each end of conduits provided for future equipment.
- D. Conduits: Mark all conduits entering or leaving panelboards with indelible black magic marker with the circuit numbers of the circuits contained inside. Identify all Fire Alarm System conduits with red paint or red tape wrapped a

minimum of 4 times around the conduit every 10 feet and at each fire alarm system junction box.

- E. Junction Boxes: Mark the circuit numbers of wiring on all junction boxes with sheet steel covers. Mark with indelible black marker. On exposed junction boxes in finished areas mark on inside of cover. Paint all Fire Alarm System junction boxes with sheet steel covers red. Mark all other Special System junction boxes with sheet steel covers with appropriate system designation, e.g., "ACS", "Telecom", etc. Mark with indelible black marker. On exposed junction boxes in finished areas mark on inside of cover.
- F. Code Required Markings and Warnings: Provide all placards, markings and identification systems required by Code and/or the Contract Documents, such as (but not limited to):
  - 1. Arc Flash.
  - 2. "Series Rated Systems".
  - 3. Conductor insulation color identification.
  - 4. Special conductor identification and legends.
  - 5. Emergency systems markings.
  - 6. Multiple services placards.
  - 7. Warning messages shall include an appropriate plain language imperative command, such as "DANGER HIGH VOLTAGE - KEEP OUT".

#### **1.10 AS-BUILT DRAWINGS**

- A. Reference requirements stated elsewhere in these Specifications.
- B. In addition to other requirements, mark up a clean set of drawings as the work progresses, to show the dimensioned location and routing of all electrical work. Show routing and location of items cast in concrete or buried underground. Show routing of work within the building. Show complete routing and sizing of any significant revisions to the systems shown.
- C. Maintain As-Built Drawings in an up-to-date fashion in conjunction with the actual progress of installation. Accurate progress mark-ups shall be available on-site for examination by the Contracting Agency or his representative at all times.
- D. Prepare wiring diagrams using the latest release of AutoCAD for all individual special systems as installed. Identify all components and show all wire and terminal numbers and connections. Include all diagrams from the shop drawings and submittals, updated to show as-built condition.

- E. Contractor's red lines (so-called "As-Builts"), shall be prepared in accordance with to the standard of care criteria as defined in this sub-section. The Contracting Agency reserves the right to reject any or all such As-Built Drawings if, in our opinion, these criteria have not been met or if the work is not clear. Any costs incurred as a result of the Contractor's failure to meet these criteria such as, but not limited to, resubmittals, meetings, site visits and written correspondence, shall be reimbursed as additional services. The acceptable standard of care includes the following:
1. Full size As-Built Drawings shall be neatly marked-up by the Contractor to show actual installation conditions using the symbols, line types and abbreviations as shown in the contract document's legends and abbreviations. Red shall be used to show items to be added, green for items to be removed and blue for general clarification comments not to be drafted.
  2. All line work shall be drawn using a straight edge and all notes shall be neatly printed and legible. Leaders and sheet notes shall be used where necessary using a similar style to that shown throughout the drawings.
  3. All under slab and otherwise inaccessible piping, ducting, and other components shall be accurately dimensioned to the nearest one-inch increment. Complete and submit As-Built Drawings that include inaccessible components, such as plumbing and heating piping and electrical conduit on underfloor plans involving slab on grade floor construction, for review prior to pouring of the slab.
  4. Where equipment is furnished having different dimensions than those shown, the drawings shall be modified to show the dimensions of the equipment provided.
  5. Where equipment is shown in more than one drawing location, (i.e., plan and section), revised equipment arrangement shall be shown in all drawing locations.
- F. At completion of project, deliver the As-Built Drawings to the Contracting Agency and obtain written receipt.

#### **1.11 OPERATING INSTRUCTIONS**

- A. Prior to final acceptance, instruct an authorized representative of the Owner for eight hours on the proper operation and maintenance of all electrical systems and equipment under this contract. This requirement is for several systems, and is in addition to all special training specified in other sections. Make available a qualified technician for each component of the installation for this instruction. Give these operating instructions after the operation and maintenance manuals have been furnished to the Owner. Submit written certification, signed by the Contractor and an authorized representative of the Owner, that this has been completed.

## 1.12 OPERATION AND MAINTENANCE MANUALS

- A. Provide Operation and Maintenance Manuals in the manner described elsewhere in these specifications. In addition, organize manual and include data and narrative as noted below.
  - 1. Final Manuals shall be provided not later than one week prior to requesting inspection for Substantial Completion.
  - 2. Submit all 8-1/2 by 11 inch literature and equipment data in hard-back, three-ring, loose-leaf binders by individual sets. Cardboard or paper binders are unacceptable.
- B. Provide a separate chapter for each section of the electrical specifications with sub-chapters for each class of equipment or system. Provide a table of contents for each chapter, and each major item in each chapter, to indicate the page number of each. Provide a summary of product warranty terms and duration for each piece of equipment. Label all pages to assure correct placement in manual. Identify each piece of equipment with its associated specification description.
- C. Operating Sequence Narrative:
  - 1. In each chapter, describe the procedures necessary for personnel to operate the system and equipment covered in that chapter.
  - 2. Describe procedures for start-up, operation, emergency operation, and shutdown of each system. If a particular sequence is required, give step-by-step instructions in that order.
  - 3. Describe all seasonal adjustments that should be accomplished for each system.
  - 4. Provide the above descriptions in typewritten, simple outline, narrative form.
- D. Maintenance Instructions:
  - 1. Provide complete information for preventive maintenance for each product, including recommended frequency of performance for each preventive maintenance task.
  - 2. Provide instructions for minor repair or adjustments required for preventive maintenance routines, limited to repairs and adjustments that may be performed without special tools or test equipment and which require no extensive special training or skills.
  - 3. Provide all information of a maintenance nature covering warranty items, etc., that are not discussed in the manufacturers literature or the operating sequence narrative.
  - 4. Provide complete information data for all the spare and replacement parts for each product and system. Properly identify each part by part number and manufacturer.
- E. Manufacturers' Brochures: Include manufacturers' descriptive literature covering all products used in each system, together with illustrations, exploded views and renewal parts lists. Highlight all applicable items and instructions, or mark-out non-applicable items.

- F. Shop Drawings: Provide a copy of all corrected, approved shop drawings for the project, updated to show as-built condition, either with the manufacturers' brochures or properly identified in a separate subsection.
- G. Operation and Maintenance Manuals shall be fully corrected to include review comments prior to final submission to the Owner.

### 1.13 PROJECT COMPLETION AND DEMONSTRATION

- A. Tests: During final inspection, conduct operating tests for approval. Demonstrate installation to operate satisfactorily in accordance with requirements of Contract Documents. Should any portion of installation fail to meet requirements of Contract Documents, repair or replace items failing to meet requirements until items can be demonstrated to comply. Have instruments available for measuring light intensities, voltage, and current values and for the demonstration of continuity, grounds, or open circuit conditions. Furnish personnel to assist in taking measurements and making tests. In the event that systems are not complete and fully operational at the time of final inspection, all costs of any subsequent inspections shall be borne by the Contractor at no additional cost to the Owner.
- B. Certificate of Completion: Submit at time of request for final inspection, a complete letter in the following format:  
I, \_\_\_\_\_(Name), of \_\_\_\_\_(Firm), certify that the electrical work is complete in accordance with Contract Plans and Specifications, and authorized change orders (copies of which are attached hereto) and will be ready for final inspection as of \_\_\_\_\_(Date). I further certify that the following Specifications requirements have been fulfilled:
  - 1. Megger readings performed, \_\_\_\_ copies of logs attached.
  - 2. Operating manuals completed and instruction of operating personnel performed,  
\_\_\_\_\_ (Date) \_\_\_\_\_(Signed)  
Owner's Representative
  - 3. Record document drawings up-to-date, accurate, and ready to deliver to Contracting Agency.
  - 4. Emergency systems tested and fully operational.
  - 5. Fire Alarm System tested and fully operational.
  - 6. Security System tested and fully operational.
  - 7. Telecommunications System test reports have been submitted to and approved by the Contracting Agency. The test reports shall certify that the Telecommunications System is complete, passes all test criteria, is fully operational, and that all work has been witnessed as specified.
  - 8. All other tests required by Specifications have been performed.
  - 9. All specified Owner training complete.
  - 10. All systems are fully operational. Project is ready for final inspection.

SIGNED: \_\_\_\_\_ DATE: \_\_\_\_\_  
TITLE: \_\_\_\_\_

### **1.14 WARRANTY**

- A. Warranty work shall be promptly coordinated and performed at the Contractor's sole expense. All workmanship, labor and materials (without limitation) in this Division shall be warranted for the longer of the following:
  - 1. As called for in the General Conditions of the Contract.
  - 2. For a minimum period of one year from the date of final acceptance.
  - 3. For the extended warranty period specified in a specific Section under this Division.
- B. Where a specific product carries a longer warranty as a standard offering of its manufacturer, extended warranty coverage beyond these requirements shall be retained by the Owner. The Owner will have recourse back to the manufacturer only in these cases, when the warranty as specified in A above has expired.

### **PART 2 - PRODUCTS - NOT USED**

### **PART 3 - EXECUTION**

#### **3.1 COORDINATION WITH ROOM NUMBERING**

- A. Certain systems provided under this Division rely on identification systems that are based on room names or numbers. Systems labeled in this fashion include, but are not limited to, panelboards, circuit directories, communication and data systems identifiers, fire alarm systems, etc.
- B. The numbering scheme indicated in these Contract Documents is based on room numbers assigned during the design process. The Owner reserves the right to change the numbers prior to substantial completion, and the final names and numbers will not necessarily match those found in the Documents. Obtain from the Owner the final room numbers prior to commencing the numbering of Division 16 systems. Tag and label all system circuits and devices in accordance with the final numbering scheme at no additional cost.

#### **3.2 ACCESS DOORS**

- A. Provide access doors required for access to equipment provided under Division 16. Doors shall be rated for the surrounding construction. Use of access doors shall be minimized, and all locations and cosmetic features shall be submitted for approval in advance.
- B. Doors shall be finished to match surrounding surfaces as approved by the Contracting Agency.

### 3.3 FIRE ALARM SYSTEM

- A. Existing Fire Alarm Systems: Maintain existing systems in service. Disable systems only to make switchovers and connections. Notify the Department and applicable Fire Department Authorities at least 72 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area. Provide fire watch for entire affected area for entire duration of outage. System outage shall not be considered terminated until the system has been tested and accepted in accordance with NFPA 72.
- B. Provide new fire alarm devices or remove or relocate existing fire alarm devices as shown on the plans. New devices shall be identical to existing similar devices and UL Listed with the existing fire alarm system.
- C. Provide required equipment, cards, programming, batteries, etc. at the existing fire alarm system control panel(s) and the remote system front end terminals to support revised fire alarm system. Submit battery calculations for revised system. Fire alarm work shall be in accordance with the requirements of NFPA 72.
- D. Perform reacceptance testing of the fire alarm system in accordance with NFPA 72. Coordinate testing with the Department. Provide a minimum of 72 hours notice. Contractor shall not be entitled to any additional compensation due to inability of the Department to schedule test at the desired time. Submit final test results.

### 3.4 DEMOLITION

- A. Examination Prior to Bid: Drawings involving existing conditions are based on building record drawings and/or limited field observation. Conduct a site inspection prior to submission of Bid to become thoroughly familiarized with the Scope of Work. Report discrepancies to Contracting Agency. Submission of bid certifies acceptance of existing conditions.
- B. Examination Prior to Start of Demolition: Conduct a thorough site inspection before disturbing existing installation. Verify field measurements and circuiting arrangements. Verify that abandoned wiring and equipment serve only abandoned facilities. Beginning of demolition certifies acceptance of existing conditions.
- C. Preparation:
  - 1. Disconnect electrical systems in walls, floors, ceilings, etc., scheduled for removal.
  - 2. Coordinate utility service outages with the Contracting Agency.
  - 3. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
  - 4. Existing Access Control System: Maintain existing system in service. Disable system only to make switchovers and connections. Notify Owner at least 72 hours before partially or completely disabling system. Minimize



outage duration. Make temporary connections to maintain service in areas adjacent to work area. Refer to Specification Section 13720 – ACS Sequence and Cutover for detailed system cutover, sequencing and demolition requirements.

5. Existing Electrical Service: Maintain existing systems in service. Disable system only to make switchovers and connections. Obtain permission from Owner at least 72 hours before partially or completely disabling system. Contractor shall not be entitled to any additional compensation due to inability of Owner to grant an outage at the desired time. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

D. Demolition of Existing Electrical Work:

1. Remove, relocate, and extend existing installations to accommodate new construction.
2. Remove abandoned wiring to source of supply.
3. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes unless otherwise noted on the drawings. Cut concealed conduit flush with walls and floors, and patch surfaces.
4. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets, which are not removed. In finished areas, blank covers shall be blank plates matching the device plates specified for new work, unless otherwise noted or specified.
5. Disconnect and remove abandoned panelboards and distribution equipment.
6. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
7. Disconnect and remove abandoned light fixtures. Remove brackets, stems, hangers, and other accessories.
8. Repair adjacent construction and finishes damaged during demolition and extension work.
9. Maintain access to existing electrical installations that remain active. Modify installation or provide access panels as appropriate.
10. Restore circuits and systems to remain that are affected in any way by demolition Work, such as loads downstream of demolished equipment, switched lighting circuits where selected fixtures are demolished, etc.
11. Salvage or disposal of removed items shall be as noted on the drawings or as directed by the Contracting Agency. Items, which the Owner does not desire to retain, shall be disposed of at a legal disposal site.

E. Cleaning and Repair:

1. Clean and repair existing materials and equipment that remain or are to be reused or are affected by this work.
2. Panelboards: Clean exposed surfaces and interior of cabinet and retorque electrical connections. Provide closure plates for vacant

positions. Provide typed circuit directory showing revised circuiting arrangement.

### **3.5 REPAIR OF EXISTING**

- A. Repair all surfaces damaged or impacted by the work. Restore to original condition or better. Retexture surfaces to match surrounding surfaces. Repaint all affected surfaces, with extent of paint to include adjacent surfaces to next wall or other clean break to avoid mismatched finish.

**END OF SECTION 16010**

**SECTION 16050**  
**BASIC MATERIALS AND METHODS**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This section describes specific requirements, products, and methods of execution, which are typical throughout the electrical work of this project. Additional requirements for the specific systems may modify these requirements.

**1.2 COORDINATION**

- A. Lay out all the work in advance and avoid conflict with other work in progress. Physical dimensions shall be determined from existing conditions. Verify locations for junction boxes; disconnect switches, stub-ups, etc., for connection to equipment furnished by others, or in other Divisions of this Work.

**1.3 SERVICEABILITY OF PRODUCTS**

- A. Furnish all products to provide the proper orientation of serviceable components to access space provided.
- B. Coordinate installation of panels, equipment, system components, and other products to allow proper service areas for all items requiring periodic maintenance inspection or replacement.
- C. Replace or relocate all products incorrectly ordered or installed.

**1.4 ACCESSIBILITY OF PRODUCTS**

- A. Arrange all work to provide access to all serviceable and/or operable products. Layout work to optimize net usable access space within confines of space available. Advise Contracting Agency, in a timely manner, of areas where proper access cannot be maintained. Furnish layout drawings to verify this claim, if requested.
- B. Provide access doors in ceilings, walls, floors, etc., for access to junction boxes, automatic devices, and all serviceable or operable equipment in concealed spaces.

**PART 2 - PRODUCTS**

**2.1 MATERIALS AND EQUIPMENT FURNISHED IN DIVISION 16**

- A. All materials furnished and installed in permanent construction shall be American made, new, full-weight, standard in every way, and in first class condition.
- B. All materials shall conform with the standards of an organization acceptable to the Authority Having Jurisdiction and concerned with product evaluation, that maintains periodic inspection of labeled equipment or materials and by whose labeling the manufacturer indicates compliance with appropriate standards or

performance in a specified manner. Only materials designed for the purpose employed shall be used.

- C. Materials shall be identical with apparatus or equipment that has been in successful operation for at least two years. All materials of similar class or service shall be of one manufacturer.
- D. Capacities, sizes, and dimensions given are minimums unless otherwise indicated. All systems, materials and equipment proposed for use on this project shall be subject to review for adequacy and compliance with Contract Documents.

## **2.2 MATERIALS AND EQUIPMENT FURNISHED IN OTHER DIVISIONS**

- A. Controls, including conduit, wiring, and control devices required for the operation of systems furnished in other Divisions shall be provided complete under the Division of the Specifications in which the equipment is specified, unless otherwise noted or specified.
- B. All work on the project that falls under the jurisdiction of the electrical trade shall be performed by Licensed Electricians in conformance with the electrical specifications.
- C. Provide complete power connections to equipment including but not limited to feeders, connections, disconnects and motor running overcurrent protection. Where starters are provided as part of packaged equipment, overcurrent heaters shall be provided under Division 16.

## **PART 3 - EXECUTION**

### **3.1 STORAGE AND HANDLING**

- A. All items shall be delivered and stored in original containers, which shall indicate manufacturer's name, the brand, and the identifying number. Items subject to moisture and/or thermal damage shall be stored in a dry, heated place. All items shall be covered and protected against dirt, water, chemical, ultraviolet (UV) and/or mechanical damage.

### **3.2 PROTECTION OF MATERIAL AND EQUIPMENT**

- A. The Contractor shall be responsible for any and all materials and equipment to be installed under this Contract. The Contractor shall make good at his own cost any injury or damage which said materials or equipment may sustain from any source or cause whatsoever before final acceptance.

### **3.3 INSTALLATION**

- A. Skilled craftsmen shall install all materials and equipment. The norms for execution of the work shall be in conformity with NEC Chapter 3 and the National Electrical Contractors' Association "National Electrical Installation Standards", which herewith is made part of these specifications.
- B. Repair all surfaces and furnish all required material and labor to maintain fireproof, airtight and waterproof characteristics of the construction.

- C. Installation of all equipment shall be in accordance with manufacturers' instructions.

### 3.4 MOUNTING HEIGHTS

- A. Mounting height shall be to center of box above finished floor (AFF) as noted below unless otherwise shown or indicated. Other mounting heights are indicated on the drawings by detail. Specific dimensions AFF are shown adjacent to the symbol. Where devices are shown on architectural elevations, the elevation height shall govern.

Lighting switches	48 inches
Convenience outlets and similar devices	16 inches (see note below)
Convenience outlets in mechanical, boiler rooms and workrooms	48 inches
Motor controllers	60 inches to top
Panelboards	76 inches to top
Telephone panels	72 inches to top
Telecommunications (Data/Telephone) outlets	16 inches (see note below)
All bells, chimes, strobes, and similar signal devices	80 inches to bottom of device unless otherwise noted
Manual fire alarm box	48 inches to highest operable part of device

- B. NOTE: In locations where baseboard-heating enclosures are to be installed, outlet-mounting height shall be raised to 6 inches above top of enclosure unless otherwise noted on drawings.

### 3.5 CUTTING & PATCHING

- A. Obtain written permission of the Contracting Agency before cutting or piercing structural members.
- B. Sleeves through floors and walls shall be galvanized steel pipe, flush with walls, ceilings or finished floors, sized to accommodate the raceway. Grout all sleeve penetrations through concrete walls or floors. Holes through existing concrete shall be core drilled. X-ray concrete before core drilling. Do not cut rebar without specific authorization from the Contracting Agency. Seal openings with UL Listed fire resistant resilient sealant.

### 3.6 VAPOR BARRIER PENETRATIONS

- A. Penetrations of the building vapor barrier caused by the electrical installation shall be minimized, and where they are necessary, the opening in the vapor barrier shall be cut smaller than the penetrating object, so that the penetration will be a stretch fit. The penetration shall then be securely sealed with vapor-

barrier tape or an adhesive or caulk compatible with the surfaces being sealed.

### **3.7 FIRE RESISTIVE CONSTRUCTION**

- A. Provide "tenting" or other protection acceptable to the Authority Having Jurisdiction for devices or fixtures installed in fire resistive construction (i.e., ceilings, walls, etc.) to maintain the fire resistive rating of the complete assembly.
- B. Where electrical raceways or other features penetrate fire-rated building surfaces, they shall maintain the integrity of the building surface being penetrated. This shall be accomplished with either of the following methods:
  - 1. Sealing the penetration with an approved fire rated caulk or putty.
    - a. Fire rated caulk or putty: 3M Fire Barrier Caulk No. CP25, 3M Fire Barrier Moldable Putty, or as approved.
  - 2. A fire rated assembly enclosing the penetration.
    - a. Fire rated assembly: STI EZ Path, or as approved.
  - 3. All firestopping shall be applied according to the manufacturer's recommendations, and in a manner that is listed by a nationally-recognized independent testing agency (such as UL) as preserving the fire time-rating of the construction.

### **3.8 SOUND ISOLATION**

- A. Where electrical raceways or other features penetrate walls that extend to structure, they shall maintain the integrity of the building surface being penetrated. Refer to the requirements of FIRESTOPPING as specified above. Note that this requirement exists regardless of whether the building surface being penetrated has a fire rating.
- B. Boxes (electrical boxes, outlet boxes and telecommunication boxes, etc) penetrating wall types containing sound attenuation batts shall be sealed airtight using STI Series SSP Firestop Putty Pads to reduce sound transmission and increase fire resistance. Mold putty pads around electrical junction boxes and conduits to form an airtight seal in accordance with manufacturer's installation instructions.

### **3.9 PROTECTIVE FINISHES**

- A. Take care not to scratch or deface factory finish of electrical apparatus and devices. Repaint all marred or scratched surfaces.
- B. Provide hot dip galvanized components for ferrous materials exposed to the weather.

### **3.10 SEPARATION OF SYSTEMS**

- A. Conductors and equipment of different voltage levels, frequency, current characteristics (AC & DC) or functions (normal vs. emergency, etc.) shall not share the same raceways or enclosures unless specifically shown on the

Drawings or approved by the Contracting Agency, or inherently necessary for correct system function (i.e., at transfer switches, transformers, etc.)

### **3.11 TESTING**

- A. Prior to final test, all switches, panelboards, devices, and fixtures shall be in place.
- B. Test all electrical systems. They shall be free from short circuits and unintentional grounds.
- C. Furnish one (1) copy of certified test results to the Contracting Agency prior to final inspection.

### **3.12 CLEAN-UP AND COMMISSIONING**

- A. Throughout the work, the Contractor shall keep the work area reasonably neat and orderly by frequent periodic cleanups.
- B. As independent parts of the installation are completed, they may be commissioned and utilized during construction.

**END OF SECTION 16050**

## **SECTION 16111**

### **CONDUIT AND FITTINGS**

#### **PART 1 - GENERAL**

##### **1.1 DESCRIPTION**

- A. This section describes specific requirements, products, and methods of execution relating to conduit and conduit fittings approved for use on this project. Type, size and installation methods shall be as shown on Drawings, required by Code and specified in this Section.

##### **1.2 QUALITY ASSURANCE**

- A. Conduit and conduit fittings shall be standard types and sizes as manufactured by a nationally recognized manufacturer of this type of materials and be in conformity with applicable standards and UL listings.

##### **1.3 SUBMITTALS**

- A. Provide submittals for all products in accordance with Section 16010 and Division 1.

#### **PART 2 - PRODUCTS**

##### **2.1 CONDUIT**

- A. Conduit types specifically approved for use on this project shall be of the following types only:
1. Galvanized rigid metal conduit – GRC or RMC.
  2. Intermediate metal conduit – IMC.
  3. Rigid copper-free aluminum conduit.
  4. Electrical metallic tubing – EMT.
  5. Polyvinyl chloride conduit – PVC: May be Schedule 40 or Schedule 80, except where Schedule 80 is specifically noted or specified.
  6. Flexible metal conduit – FMC or flex: In short lengths as specifically permitted.
  7. Liquid-tight flexible metal conduit – LFMC: In short lengths as specifically permitted.
  8. Extreme temperature liquid-tight flexible steel conduit – AT: Shall have temperature rating of -67 ° F to +220 ° F, Liqueatite "ATLA", or as approved.
  9. Plastic-Coated Conduit – PCC: Shall be hot-dip galvanized Schedule 40 rigid steel conduit, coated outside with a 40 mil jacket of PVC and inside with a urethane compound; PVC coating shall be U.L. Listed for corrosion protection on steel conduit with no disclaimers; RobRoy "Plasti-Bond Red", or as approved.
  10. Types specifically identified on the Drawings or in the Specifications
  11. Other products not specifically approved such as ENT, MC Cable, Surface Metal Raceway, etc., are not allowed.



12. Manufactured wiring systems are not approved.

## 2.2 FITTINGS

- A. Fittings utilized with rigid steel, IMC, and aluminum shall be galvanized steel or iron or copper-free aluminum and shall be threaded. Conduit bushings shall be provided and shall be of the insulated types. Where grounding bushings are required, provide insulated grounding bushings with integral pressure type ground lugs, Thomas & Betts "Blackjack", or as approved.
- B. Couplings and connectors for EMT shall be made of steel or malleable iron. Die-cast products shall not be used. All connectors shall have insulated throats. Connectors and couplings shall be compression type; setscrew types are not allowed.
- C. Fittings for PVC shall be polyvinyl chloride, installed using PVC solvent to form a watertight joint, except elbows (including bends exceeding 15°) shall be metallic. These metallic elbows and bends shall be of the type specified in this section for the environment in which they are to be installed.
- D. Fittings for flexible metal conduit shall be steel or malleable iron only. All throats shall be insulated.
- E. Fittings for liquid-tight flexible conduit shall be steel or malleable iron, of a type incorporating a threaded grounding cone, nylon or plastic compression ring, and a tightening gland, providing a low resistance ground connection. All throats shall be insulated.
- F. Plastic-Coated Conduit shall be connected only with similarly-coated threaded fittings (including conduit bodies) and couplings, with overlapping plastic joints.

## PART 3 - EXECUTION

### 3.1 USES PERMITTED

- A. Conduits shall be of the sizes shown on the Drawings or as required by the NEC, whichever is larger. Base sizes on using type XHHW for wire sizes #6 and smaller and type THHN/THWN wire for wire sizes #4 and larger. Unless otherwise noted, conduits installed in the following locations shall be of the types specifically identified only:
  - 1. Underground under roads or in paved areas or where subject to traffic or encased in concrete – PCC.
  - 2. Underground where not under roads, paved areas, areas subject to traffic or encased in concrete – PVC-40.
  - 3. Outdoors aboveground or damp locations – RMC, rigid aluminum, IMC or extreme temperature liquid-tight flexible steel conduit (where required).
  - 4. Dry indoor locations, concealed or exposed – RMC, rigid aluminum, EMT (where not susceptible to physical damage), flexible conduit where necessary, or IMC.
  - 5. Indoor locations, exposed, where susceptible to physical damage – RMC or IMC. This includes baggage handling areas and baggage makeup areas less than 96 inches above finished floor.

6. Motor and equipment flexible connections – LFMC.
7. Flexible metal conduit (FMC) may be used in existing non-accessible spaces where required to be fished. Submit for approval, prior to installation, all intended applications. Lengths of flexible conduit shall be minimized to the greatest extent practicable.

### **3.2 INSTALLATION METHODS - GENERAL**

- A. Concealed raceways: In occupied areas, all conduit and raceways shall be concealed unless specifically noted otherwise. In service spaces (mechanical equipment rooms, electrical rooms, storage closets, etc.), approved raceways may be surface-mounted for connection to equipment in exposed surface mounted locations and in exterior locations as noted on the Drawings.
- B. Concealed raceways shall be routed as directly as possible with a minimum of bends. Concealed raceways above lay-in ceilings shall be installed a minimum of 12 inches above the ceiling grid.
- C. Exposed Raceways: Where allowed by this Specification or specifically noted on the Drawings, raceways may be mounted on the surface of walls, ceilings and other surfaces. Exposed raceways shall comply with the following:
  1. Exposed raceways shall be run parallel or perpendicular to building lines and bent symmetrically or made up with standard elbows or fittings.
  2. Surface-mounted conduits, junction boxes, pull boxes, outlet boxes, etc. installed in finished areas shall be painted to match the surrounding surfaces.
  3. Connectors and fittings for raceways and conduits installed on the surface in exterior locations shall be suitable for and Listed for use in a wet location.
  4. Conduits installed in exterior locations shall be painted to match the exterior finish of the building surface to which they are attached. This shall include conduits attached via racks and stand-off brackets, or attached directly to the surface.
  5. Surface mounted raceways (e.g., Wiremold) are not approved for use on this project. All wiring shall be installed in conduit.
- D. Conduit and tubing shall be cut square and reamed smooth at the ends and all joints made tight. Conduit threads shall be lubricated with an approved thread lubricant.
- E. Each conduit shall enter and be securely connected to a cabinet, junction box, pull box or outlet box by means of a locknut on the outside and a locknut/bushing on the inside, or by means of a liquid-tight, threaded, self-locking, cold-weld type wedge adapter. All connections shall be made wrench tight. All locknuts shall be the bonding type with sharp edges and shall be installed in a manner that will assure a locking installation. Locknuts and bushings or self-locking adapters will not be required where conduits are screwed into threaded connections. All runs of conduit shall be protected from the entrance of foreign material prior to the installation of conductors.

- F. Conduit or tubing deformed or crushed in any way shall not be installed. Conduit shall be bent only with approved bender (hydraulic or hickey). Bending machines shall be used to make field bends in conduit of 1-1/4 inch size and larger. Torches shall not be used in making conduit bends.
- G. Raceways shall be spaced at least 6 inches from parallel runs of heating system pipes, flues, other high temperature piping systems, and other heat sources. This basic spacing shall be increased if necessary to ensure that raceways experience no significant temperature rise from external sources. Raceways shall not be embedded in any spray-applied insulation, fireproofing, or other materials that would restrict heat dissipation.
- H. Pull wires shall be provided in all spare and unused conduits. (Nylon "jet-line" or as approved.)
- I. Clean conduits 3-inches and larger utilizing conduit mandrels.
- J. All conduits stubbed up out of floor and terminating inside of an enclosure shall have insulating grounding bushings installed.
- K. Raceways penetrating vapor barriers or traversing from warm to cold areas shall be sealed on the inside with a non-hardening duct sealing compound to prevent the accumulation of moisture, and shall be taped airtight to the vapor barrier on the outside.
- L. Raceways (particularly PVC) shall be provided with expansion joints where necessary to allow for thermal expansion and contraction. Set initial opening of expansion joints per manufacturer's instructions, to suit the ambient temperature at the time of installation.
- M. Provide flexible conduit connection at all seismic joints to allow for displacement of conduit in all three axes. Connection shall allow for movement in accordance with design of seismic joint. Provide appropriate lengths of flexible conduits at seismic joints and appropriate amounts of slack in conduit to allow movement of conduit/cabling in accordance with the design of the seismic joint. Slack shall be maintained in conduit after cabling is installed. Minimum lengths of flexible conduit and minimum amount of slack for various size conduits shall be as follows:
  - 1. 2 inch and greater: 4 foot length, 4-6 inches slack.
  - 2. 1-1/2 inch and smaller: 2 foot length, 3 inches slack.
- N. Flexible metal conduit with supplemental ground jumper shall be used for connection to vibrating equipment, or where installation conditions warrant its use with express permission. Flexible conduit shall not penetrate walls. Liquid-tight flexible conduit with supplemental ground jumper shall be used for all motor and transformer connections. The ground jumper in flexible conduits shall be routed within the conduit.
- O. Length of flexible conduit shall not exceed 36 inches, except for lighting fixture whips and where specifically noted (e.g. existing non-accessible spaces where required to be fished). Fixture whips shall not exceed 72 inches. Flexible conduit shall not penetrate walls.

- P. Electrical raceways may penetrate roofing membranes only where absolutely necessary. Submit intended locations to Contracting Agency for approval prior to installation. Such penetrations shall be flashed and sealed as required for mechanical piping penetrations of roof. Where practical, conduits stubbed up to roof-mounted equipment shall be routed within the equipment curb supporting the equipment.

### **3.3 INSTALLATION METHODS - TELECOMMUNICATIONS SYSTEMS**

- A. Installation methods for telecommunication system conduits shall comply with Installation Methods – General, above, unless superseded by more stringent requirements of this section.
- B. Telecommunications conduits shall comply with the requirements of TIA/EIA-569 and the Building Industry Consulting Service International (BICSI) Telecommunications Distribution Methods Manual. Note that some of these requirements are more stringent than the requirements of the National Electrical Code.
- C. There shall be no more than two 90-degree bends between pull points in telecommunications conduit. Pull boxes added to conduit runs as a result of this requirement shall be in accordance with Section 16132 – Pull and Junction Boxes. If it is not practical to install a pull box in the run due to field conditions, the conduit size shall be increased to the next trade size for each additional 90-degree bend. Offsets shall be considered as equivalent to a 90-degree bend.
- D. Inside radius of conduit bends shall be at least 6 times the internal diameter of the conduit for sizes up to 2 inch trade size; 10 times the internal diameter of the conduit for sizes larger than 2 inch trade size. Where bending machine shoes are not available with the required bending radius for a one-shot field bend, factory bent, large radius 90-degree elbows shall be provided. Conduits of all sizes for use as optical fiber raceways shall have a minimum inside bend radius of 10 times the internal diameter of the conduit.
- E. Conduits stubbed to cable trays shall be terminated within a maximum horizontal distance of 4 inches from the tray and in a vertical zone between 1 to 6 inches above tray. Conduits shall be supported from structure within a maximum horizontal distance of 12 inches from the tray. Conduits shall be provided with a grounding bushing and shall be bonded to the cable tray with a minimum 12 AWG copper conductor.
- F. Use of flexible conduit for telecommunications shall be kept to a minimum and shall be at the discretion of the Contracting Agency. Obtain prior written approval for the use of flexible conduit. Where required due to physical considerations, flexible metal conduit may be allowed in lengths not exceeding 4 feet. If used, flexible metal conduit shall be increased by one trade size for the application used (see Conduit Sizes).
- G. Conduits entering the telecommunications room or equipment room through the floor shall be terminated 4 inches above finished floor. Conduits entering

the telecommunications room or equipment room from above shall be terminated 4 inches below the finished ceiling, but in no case shall the conduits terminate greater than 12 inches above the cable pathway support or distribution frame.

- H. Conduit sleeves connecting vertically "stacked" telecommunications rooms shall be terminated 4 inches above finished floor. Conduits and cutout openings between floors shall be sealed with firestopping material that is reusable, to accommodate additions and deletions, moves and changes in the cabling system.
- I. Layout of conduits shall give consideration to nearby sources of electromagnetic energy such as electrical power wiring, large electric motors and generators, induction heaters, arc welders, variable frequency drives, etc. Maintain the greatest separation practicable between telecommunication raceways and sources of electromagnetic interference (EMI). A minimum of 5 inches of separation shall be maintained between telecommunication raceways and fluorescent lighting ballasts.
- J. Pull wires shall be provided in all spare and unused conduits. (Nylon "jet-line" or as approved.)
- K. Maintain minimum separation from < 480V power wiring in accordance with the following table:

Condition	Minimum Separation Distance		
	< 2 kVA	2-5 kVA	> 5 kVA
Unshielded power lines or electrical equipment in proximity to open non-metal telecommunications pathways	5 inches	12 inches	24 inches
Unshielded power lines or electrical equipment in proximity to a grounded metal telecommunications conduit pathway	2.5 inches	6 inches	12 inches
Power lines enclosed in a grounded metal conduit (or equivalent shielding) in proximity to a grounded metal telecommunications conduit pathway	--	3 inches	6 inches

### 3.4 CONDUIT SIZES - GENERAL

- A. Minimum sizes for rigid steel, IMC, PCC, rigid aluminum and PVC-40 conduits shall be ¾ inch.
- B. Minimum size for EMT shall be ½ inch.

- C. Minimum size for flexible conduits shall be ½ inch, except fixture whips may be 3/8 inch as allowed by the NEC.
- D. Maximum size for EMT shall be 3 inch, except telecom backbone conduits may be 4 inch where shown on the drawings.

### **3.5 CONDUIT SIZES - TELECOMMUNICATIONS SYSTEMS**

- A. Minimum size for conduit runs to outlets is 1 inch.
- B. Individual conduit homeruns shall serve no more than one telecommunications outlet.

### **3.6 STRUCTURAL COORDINATION**

- A. Structural members shall not be cut, drilled, or notched for raceways or other electrical features unless specifically accepted by the Contracting Agency.
- B. X-ray concrete prior to core drilling. Do not cut rebar without specific authorization from the Contracting Agency. Protect existing equipment and building finishes prior to performing core drills. Replace or repair equipment and/or building finishes damaged during core drilling operations as directed by the Contracting Agency.

### **3.7 EXISTING CONDUIT**

- A. Accurately measure the physical length of all existing conduits by the use of True Tape or an approved equivalent prior to the purchase or installation of any cable, wire, or innerduct. Costs incurred as a result of not obtaining accurate lengths of prior to the purchase or installation of cable, wire, or innerduct; such as the need to replace cable, wire or innerduct, shall be the responsibility of the Contractor.

**END OF SECTION 16111**

## **SECTION 16120**

### **WIRE AND CABLE**

#### **PART 1 - GENERAL**

##### **1.1 DESCRIPTION**

- A. This section describes specific requirements, products, and methods of execution relating to wire and cable, 600 volts or less, approved for use on this project.

##### **1.2 QUALITY ASSURANCE**

- A. All conductors shall be sized according to American Wire Gauge (AWG). Stranding, insulation, rating and geometrical dimensions shall conform to UL and ICEA specifications.

##### **1.3 SUBMITTALS**

- A. Provide submittals for all products in accordance with Section 16010 and Division 1.

#### **PART 2 - PRODUCTS**

##### **2.1 INSULATION TYPES**

- A. Branch circuit conductors shall be 600 volt insulated, and unless otherwise noted on the Drawings, shall have the following insulation types:
  - 1. Heated indoor spaces - THHN/THWN or XHHW.
  - 2. Outdoors, wet locations (such as slab-on-grade), or other cold locations (such as unheated attics) – XHHW.
- B. Feeder conductors shall be 600 volt insulated, and unless otherwise noted on the Drawings, shall have the following insulation types:
  - 1. Heated indoor spaces - THHN/THWN or XHHW-2.
  - 2. Outdoors, wet locations (such as slab-on-grade), or other cold locations (such as unheated attics) – XHHW-2.
- C. Nylon-jacketed conductors such as Types THHN or THWN shall not be used in any location subject to ambient temperatures below 20° F.
- D. Special applications: Conductors in fluorescent fixture wiring channels shall have 90° C insulation rating, Types THHN, XHHW, or equal. Conductors in high temperature locations shall have one of the special insulation types suitable for the use and as permitted by the NEC.

##### **2.2 FLEXIBLE CORD**

- A. All flexible cord shall be Type SO or ST, or for the larger sizes, Type G.

##### **2.3 MISCELLANEOUS**

- A. Miscellaneous: Miscellaneous wire and cable for special purpose applications and not covered in the categories as indicated above or otherwise specified, shall be as shown on the plans and/or required by the intended use.

## 2.4 MINIMUM SIZE

- A. Unless specified otherwise minimum wire sizes shall be as follows:
  - 1. #12 AWG for branch circuit wiring.
  - 2. #20 AWG for low voltage switching circuits if part of an approved cable assembly, #18 AWG otherwise.
  - 3. #14 for control circuit wiring.
- B. On 20A circuits, with one-way conductor lengths measured from panel to farthest receptacle, or center of lighting string (as applicable):
  - 1. #10 AWG for 120V circuits of 75' to 120'.
  - 2. #8 AWG for 120V circuits of 120' to 200'.
  - 3. #10 AWG for 277V circuits of 130' to 215'.
  - 4. #8 AWG for 277V circuits of 215' to 330'.
- C. Similar oversizing shall apply to circuits of other ratings and/or greater lengths, as necessary to comply with the voltage drop limitations in Part 3 of this Section.
- D. Cable or conductors for fire alarm systems and other special systems shall be as described in other sections of the specifications, noted on the drawing, or recommended by the equipment manufacturer, whichever is greater.

## 2.5 CONDUCTORS

- A. All conductors used on this project shall be copper, solid or stranded for wiring #10 and smaller, stranded for #8 and larger.
- B. Stranded control, communication, and alarm conductors shall have compression terminations where terminated on screw terminals.

## 2.6 CABLE – ACCESS CONTROL SYSTEM

- A. Card Reader: Alpha Part Number 5390C, 10 conductors, #18AWG, shielded, 75C, UL Type CM, AWM Style 2464.
- B. Delayed Egress System, Von Duprin DE5101: Alpha Part Number 5390C, 10 conductors, #18AWG, shielded, 75C, UL Type CM, AWM Style 2464. Refer to Interface Termination Box detail on Contract Drawings E502 and E503 for color coding.
- C. Balanced Magnetic Switch (Door Position Switch) and Electromagnet Bond Sensor: Belden Part Number 9740, 2 conductors, #18 AWG. Refer to Interface Termination Box detail on Contract Drawings E502 and E503 for color coding.
- D. Power Wiring (Power Supplies, Lock Power, Chexit/DE5101 Power): Refer to Interface Termination Box detail on Contract Drawings E502 and E503 for color coding.
  - 1. Between Door and Interface Termination Box (ITB): #12 Arctic Ultraflex MTW.
  - 2. Between Interface Termination Box (ITB) and Database Controller (DBC): #12 AWG THHN.



- E. Signal Wiring, Electromagnetic Locks and Horn/Strobes: Refer to Interface Termination Box detail on Contract Drawings E502 and E503 for color coding.
  - 1. Between Door and Interface Termination Box (ITB): #14 Arctic Ultraflex MTW.
  - 2. Between Interface Termination Box (ITB) and Database Controller (DBC): #14 AWG THHN.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Unless otherwise noted or specified, all conductors shall be run in raceways as specified in Section 16111. Raceways shall be installed as a complete system, free from obstructions, and clean before conductors are installed.
- B. Provide conductors from outlet to outlet and splice branch circuit conductors only at outlet or junction boxes. Install all conductors in a single raceway at one time and leave sufficient cable at all fittings or boxes. Keep all conductors within the manufacturer's allowable tension. Do not violate minimum bending radii. Lubricants for wire pullings, if used, shall conform to UL requirements for the insulation and raceway material.
- C. Do not install Type XHHW conductors in temperatures below -10° F, or the other types in temperatures below +20° F.
- D. Conductors that extend below grade shall be suitable for wet locations (type XHHW or XHHW-2). The use of THHN below grade is not acceptable.

### **3.2 CONDUCTOR SUPPORT**

- A. Provide conductor supports as recommended by the NEC or cable manufacturer in vertical conduits.

### **3.3 SPLICING**

- A. No splicing or joints are permitted in branch circuits except at outlet or accessible junction boxes. Prior to splicing, all conductors shall be stripped to the exposed length recommended by the splicing device manufacturer.
- B. Utilize compression type solderless connectors when making splices or taps in conductors No. 8 AWG or larger. Provide heat or cold shrink type insulating tubing on all splices and tape outer surface continuously with Scotch #88 plastic tape to secure insulation strength equal to that of the conductors joined.
- C. Utilize pre-insulated connectors, hard-shell type only, Ideal Industries, Inc., "Wing-Nut" or "Twister Pro" for splices and taps in conductors No. 10 AWG and smaller in dry locations.
- D. Utilize Ideal "Twister DB Plus", water repellent, sealant filled, UL 486D Listed connector splices and taps in conductors No. 10 AWG and smaller in damp or wet locations.
- E. Utilize "Buchanan pre-insulated crimp connectors" on stranded conductors for fire alarm control and alarm circuits.

- F. Splices in underground junction boxes, handholes, and manholes are not permitted.
- G. Feeder conductors shall be installed with no splices.

### 3.4 CONDUCTOR TERMINATION

- A. Provide all power and control conductors that terminate on equipment or terminal strips with solderless lugs or T & B "Sta-Kon" terminals.
- B. Prior to termination, all conductors shall be stripped to the exposed length recommended by the termination device manufacturer.

### 3.5 CONDUCTOR PHASE COLOR CODING

- A. All service, feeder and branch circuit conductors throughout the project secondary electrical system shall be color coded as follows:

208/120 Volts	Phase	480/277 Volts
Black	A	Brown
Red	B	Orange
Blue	C	Yellow
White	Neutral	Gray (see following)
Green	Ground	Green

Permanently post conductor color code at each panelboard in accordance with NEC Article 210.

- B. Where color coded conductors are not commercially available, colored non-aging, plastic tape may be utilized where permitted by NEC.
- C. Where neutrals of different systems exist on the project, neutral conductor identification method shall satisfy the Authority Having Jurisdiction, as to compliance with NEC Article 200.
- D. Phases in panelboards and similar equipment shall be connected Phase A, B, C from left to right, top to bottom, or front to back.

### 3.6 DERATING OF CONDUCTORS

- A. Derating of conductors shall be per National Electrical Code.

### 3.7 VOLTAGE DROP

- A. The maximum total voltage drop shall not exceed three (3) percent in branch circuits or feeders, for a total of five (5) percent to the farthest outlet based on steady state design load conditions. Wire sizes shown on the Drawings are for minimum ampacity. Wire and conduit sizes shall be increased to limit

voltage drop based upon actual lengths required in the field. Base voltage-drop calculations on NEC Chapter 9, Table 9.

### **3.8 OPEN WIRING ABOVE LAY-IN CEILINGS PROHIBITED**

- A. Wiring for all systems shall be installed in one of the raceway systems or cable tray systems listed for this project. Refer to the Drawings and the specific Section under which each system is specified.
- B. Access Control System and door hardware wiring shall be installed in conduit.
- C. Wiring installed in cable trays in air-handling ceiling spaces shall be approved for the application and the specific system.
- D. Raceways and sleeves shall be sized in accordance with the cabling requirements for the special system involved.

### **3.9 TESTING**

- A. All feeder cables shall be megger tested prior to final termination in accordance with Section 16050.

**END OF SECTION 16120**

## **SECTION 16131**

### **OUTLET BOXES**

#### **PART 1 - GENERAL**

##### **1.1 DESCRIPTION**

- A. This section describes general requirements, products and methods of execution relating to outlet boxes for use with wiring devices, lighting fixture outlets and telecommunications outlets approved for use on this project. Unless otherwise specified or noted on the Drawings, outlet boxes shall be sized per the National Electrical Code.

##### **1.2 QUALITY ASSURANCE**

- A. Underwriters' Laboratory listing for intended usage is required. Manufacturer and Model numbers shall be as indicated herein.

##### **1.3 SUBMITTALS**

- A. Provide submittals for all products in accordance with Section 16010 and Division 1.

#### **PART 2 - PRODUCTS**

##### **2.1 CAST BOXES**

- A. Cast boxes with threaded hubs, external mounting brackets or holes, and gasketed covers shall be used in the following locations:
  - 1. All exterior locations.
  - 2. All wet or damp locations.
  - 3. Shops, mechanical rooms, pump stations, bag makeup areas (below 96 inches above floor), etc., where exposed to mechanical damage.
  - 4. Adjacent to, water or steam connections.
  - 5. Floor boxes installed in concrete.
  - 6. All exposed interior locations below 96 inches above floor.
  - 7. Where shown on Drawings.

##### **2.2 STEEL BOXES**

- A. Galvanized pressed steel boxes may be used wherever they are permitted by code, except in areas indicated in the preceding paragraph.
- B. Flush mounted, pressed steel boxes shall be equipped with external mounting brackets for attachment to framing members with screws or nails.
- C. Ceiling boxes and wall boxes for bracket lights shall be not less than 4 inch in diameter by 1 ¼ inch deep and shall have 3/8 inch malleable iron fixture studs if required.
- D. Grounding Screw: All stamped steel boxes shall have a drilled and tapped hole in the back of the box for a grounding screw.

- E. Accessories: Box covers, extension rings, bases, hanger bars, etc., for use in connection with the installation, shall be approved for use in the various applications.

## **2.3 TELECOMMUNICATION OUTLET BOXES**

- A. Boxes for telecommunication outlets shall be a minimum of 4-11/16 inches square by 2 1/8 inches deep.
- B. Device rings for telecommunication outlets shall be single-gang, minimum 5/8 inches deep, to provided a minimum internal finished depth of 2 3/4 inches.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Outlet boxes shall be securely fastened in position and supported independently of the conduit system.
- B. Outlet boxes located in suspended ceiling system shall be fastened to ceiling "t-bar" system with bar-hanger rods manufactured for the purpose, or from hanger rods with solid supports from structure above. "T-bar" hanger rods shall be clipped to cross-members supported by the main ceiling support members. Outlet boxes supported from the suspended ceiling system shall be provided with one safety wire attached to the box or box support clip, or two safety wires attached to the bar hanger.
- C. Boxes shall be installed true to the building lines and at equal heights in conformity with mounting heights specified in other sections of the specification.
- D. Provide the best suitable box for each outlet requirement. Extension rings shall not be used on new construction except where needed to bring an outlet box out to 1/8 inch of the finished wall or ceiling line.
- E. Boxes shall have only the holes necessary to accommodate the conduits at point of installation. All boxes shall have lugs or ears to secure covers.
- F. All boxes shall be rigidly secured in position. All recessed boxes shall be so set that the front edge of the box shall be flush with the finished wall or ceiling line, or not more than 1/8 inch back of same. This requirement is more stringent than NEC requirements.
- G. All boxes shall be accessible.
- H. Provide boxes for each application that will not violate the fire rating of the wall, floor or ceiling assembly in which the box is installed.
- I. Do not place order for floor boxes without ensuring that the Contracting Agency has positively approved submittals for the specific cover types/styles colors necessary for all applications and locations.
- J. Recessed boxes shall not be placed back-to-back in adjacent rooms. They shall be offset at least 12 inches, or greater as required by codes and standards applicable to the specific construction.

- K. Boxes (electrical boxes, outlet boxes and telecommunication boxes, etc) penetrating fire rated walls or wall types containing sound attenuation batts shall be sealed airtight with approved Firestop Putty Pads to reduce sound transmission and increase fire resistance. Mold putty pads around electrical junction boxes and conduits to form an airtight seal in accordance with manufacturer's installation instructions.

**END OF SECTION 16131**

**SECTION 16132**  
**PULL AND JUNCTION BOXES**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This section describes general provisions, products and methods of execution relating to pull and junction boxes approved for use on this project. Furnish all such boxes, whether shown or not, in order to conform to requirements for maximum pulling length and maximum number of bends allowed.

**1.2 QUALITY ASSURANCE**

- A. Pull and junction boxes 50 cubic inches and smaller shall conform to specifications for outlet boxes, Section 16131.
- B. Pull and junction boxes larger than 50 cubic inches shall conform to U.L. Standard 50, Cabinets and Boxes. The UL label shall constitute proof of acceptable quality.

**1.3 SUBMITTALS**

- A. Provide submittals for all products in accordance with Section 16010 and Division 1.

**PART 2 - PRODUCTS**

**2.1 INDOOR PULL AND JUNCTION BOXES**

- A. Indoor pull and junction boxes shall conform to Article 314 of the NEC and the following requirements:
  - 1. Sheet metal boxes are approved for use in all dry, interior, nonhazardous locations.
  - 2. Boxes installed in wet locations shall be NEMA 4X, unless otherwise noted.
  - 3. Special boxes, as noted on the drawings, shall be installed in areas of specific service and/or hazards.
- B. Junction box extension rings will not be accepted on new boxes. Appropriate size boxes shall be used for each application.

**2.2 TELECOMMUNICATION SYSTEM PULL BOXES**

- A. Telecommunication system Pull Boxes shall also conform to ANSI/EIA/TIA 569 and the BICSI Telecommunications Distribution Methods (TDM) Manual.
- B. Dimensions:
  - 1. Pull boxes for straight through pulls shall have minimum interior dimensions in accordance with the following Table:

Maximum Trade Size Conduit	Size of Box			For Each Additional Conduit Increase Width
	Width (inches)	Length (inches)	Depth (inches)	
1 Inch	4	16	3	2 inches
1 1/4 Inch	6	20	3	3 inches
1 1/2 Inch	8	27	4	4 inches
2 Inch	8	36	4	5 inches
2 1/2 Inch	10	42	5	6 inches
3 Inch	12	48	5	6 inches
3 1/2 Inch	12	54	6	6 inches
4 Inch	15	60	8	8 inches

### 2.3 TELECOMMUNICATION SYSTEM SPLICE BOXES

- A. Unless otherwise specified or noted on the Drawings, splice boxes shall not be used in interior horizontal pathway conduits or interior backbone pathway conduits.

### 2.4 UNDERGROUND PULL AND JUNCTION BOXES

- A. Boxes set in ground shall be either precast concrete or cast iron. Covers shall be galvanized steel or cast iron, and shall be bonded to the grounding system with a stranded grounding conductor secured with a grounding lug. Provide sufficient slack to allow removal of the cover and normal working access.
- B. Underground concrete pull boxes installed in traffic areas shall be constructed to withstand AASHTO HS-20 wheel loading.

### 2.5 OUTDOOR ABOVE-GROUND PULL AND JUNCTION BOXES

- A. Boxes exposed to rain or installed in wet locations shall be NEMA 4X unless otherwise noted.
- B. Outdoor pull and junction boxes and conduit bodies for use with galvanized conduits shall be made of galvanized ferrous metal or cast aluminum, with integral threaded hubs or Myers-type weathertight hubs of matching composition and finish.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Junction and pull boxes shall be installed so that covers are readily accessible and adequate working clearance is maintained after completion of the installation.
- B. Select boxes properly sized per NEC for power and lighting applications.



### **3.2 TELECOMMUNICATIONS SYSTEM PULL BOXES**

- A. Where a pull box is required in a 1 inch conduit run, outlet boxes as specified in Section 16131 - Outlet Boxes may be used. Where a pull box is required in a conduit run 1 1/4 inch or larger, or where required for multiple raceways, the box shall be sized in accordance with the Table in this Section.
- B. Pull boxes shall be located in straight-through sections of horizontal cabling pathways (conduits). Pull boxes shall not be used for angle pulls or to accomplish changes in direction of the pathway.
- C. Multiple raceways connecting to telecommunications system pull boxes shall penetrate box walls such that they are distributed evenly along the Box wall.

### **3.3 TELECOMMUNICATIONS SYSTEM JUNCTION BOXES**

- A. Telecommunications system interior pathways shall not contain junction boxes.

**END OF SECTION 16132**

**SECTION 16140**  
**WIRING DEVICES**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This section describes general provisions, products and methods of execution relating to line voltage wiring devices for use on this project.

**1.2 QUALITY ASSURANCE**

- A. Manufacturers mentioned and catalog numbers specified are for establishment of type, configuration and quality.

**1.3 SUBMITTALS**

- A. Provide submittals for all products in accordance with Section 16010 and Division 1.

**PART 2 - PRODUCTS**

**2.1 DEVICES**

- A. Provide wiring devices indicated. Catalog numbers shown are Hubbell unless noted otherwise. Equal devices manufactured by Arrow Hart and Bryant are acceptable. Provide all similar devices of same manufacturer. Model numbers are for type and configuration, and shall not be used for color selection. Colors shall be as specifically noted on the Drawings and/or as indicated on the approved device submittals.

**2.2 SWITCHES**

- A. Provide 20 AMP, 277V rated switches with UL listing for tungsten lamp loads or inductive loads without derating. Switches shall be as follows:

	20A
Single Pole	CAT. NO. 1221
Three-way	CAT. NO. 1223
Four-way	CAT. NO. 1224
Key Operated	CAT. NO. 1221-L
Momentary Cont.	CAT. NO. 1557
Double Pole	CAT. NO. 1222
Pilot Switch	CAT. NO. 1221-PL

- B. Multiple 277V switches shall be installed in partition boxes or shall be furnished with shields.
- C. Other switch types shall be provided as called for on the Drawings or as required by the application.

## 2.3 RECEPTACLES

- A. Insofar as commercially available, receptacles shall be of nylon construction. Provide grounding type receptacles as follows, or as required to match equipment furnished in this or other divisions.

### Single Phase, 3-Wire Devices

20A-125V	CAT. NO. 5362	NEMA #5-20R
20A-125V GFCI	CAT. NO. GF-5362	NEMA #5-20R

- B. Outlets requiring ratings and configurations different from those listed above shall be provided as shown on the plans and/or required by the equipment served.
- C. Outlets connected to emergency or standby power shall be red unless otherwise shown on the Drawings. All other shall be as noted in 2.01.

## 2.4 DEVICE PLATES

- A. Device plates shall be satin-finished 302 stainless steel, unless otherwise noted.
- B. Indoor device plates for surface-mounted boxes shall be stainless or galvanized steel, with design to match the box and device type being used.
- C. Weatherproof switch plates shall be cast, gasketed type, Bell 216-LS-series or approved equal.
- D. Weatherproof outlet plates shall be of the safety outlet enclosure type that can be closed to remain weatherproof while in use. The outlet cover/enclosure shall be clearly marked "Suitable for Wet Locations While In Use" and "UL Listed". A gasket shall be provided between the enclosure and the mounting surface, and between the hinged cover and the mounting plate/base to assure a proper seal. Enclosure shall be oversized depth, single-gang, vertical-mount, with non-locking latch, GFCI opening, cord openings, and cover; TayMac; Specification Grade or approved equal.
- E. Engrave branch circuit designation (panel and circuit number) on receptacle and light switch device plates, e.g., "71NPA-30"). Verify final panel designations with Contracting Agency prior to engraving nameplates.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install all wiring devices indicated complete with cover plates. Cover plates shall fit snugly against finished surfaces and line up true with adjacent building lines, and be symmetrical in location and appearance.
- B. All switches shall be installed so their handles move in a vertical plane.
- C. Door swings shall be checked and, if necessary, switches shall be relocated to place them on the strike side of the door.

- D. Unless otherwise noted on the Drawings, receptacles shall be installed in the vertical position with the grounding pin down unless wording on the face of the device requires other mounting.
- E. Do not place order for devices, plates, etc., without ensuring that the Contracting Agency has positively approved submittals for the specific colors necessary for all applications and locations. Note that the selection of one color such as ivory for general use does not rule out the selection of other colors for special applications or for aesthetic reasons.

**END OF SECTION 16140**

## **SECTION 16190**

### **SUPPORTING DEVICES**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

- A. This Section includes supports for electrical equipment, including seismic supports.
- B. Related Sections:

16010 Electrical General Requirements

##### **1.2 REFERENCES**

- 1. IBC (International Building Code).
- 2. SMACNA Seismic Restraint Manual, 2<sup>nd</sup> Edition. (Sheet Metal and Air Conditioning Contractors; National Association Inc.)

##### **1.3 DESCRIPTION**

- A. Performance Requirements:
  - 1. Fixtures weighing 20 pounds or more shall be supported from structure.
  - 2. All fixed-in-place products shall be seismically braced or supported or both to conform to the Seismic Use Group and Seismic Design Category requirements of the project in accordance with the requirements of the IBC.
  - 3. Anchor all equipment, raceways, cable trays, etc., to the building structure to resist earthquake forces in accordance with the requirements of the IBC.
  - 4. Support and align all raceways, cable trays, wireways, cabinets, boxes, fixtures, equipment, etc., in an approved manner and as specified in their respective specification sections.
  - 5. All supports shall be in conformance with the requirements of the IBC, or the requirements of this Section, whichever is more stringent.
- B. Design Requirements:
  - 1. Seismic anchorages, seismic restraints, and fixture and equipment supports shall be in accordance with the latest issue of one of the following standards/guidelines:
    - a. Manufacturer's engineered solution.
    - b. Custom design by the Contractors registered civil engineer.
  - 2. Comply with the requirements of IBC Chapter 16 for seismic support of all electrical systems.
  - 3. Submit shop drawings and calculations stamped by a civil engineer registered in the State of Alaska that show compliance with the requirements for seismic requirements under IBC Chapter 16 to the AHJ in accordance with IBC 1621.3.5 for supports, anchorages and/or restraints custom designed by Contractor's registered civil engineer.

- C. Seismic Performance Criteria: The seismic design criteria (Seismic Use Group, Design Spectral Response, and Seismic Design Category) shall be verified and specified by the Contractor's civil (structural) engineer for use in designing seismic supports under this Section.

#### **1.4 SUBMITTALS**

- A. Product Data: Provide submittals for all products in accordance with Section 16010 and Division 1.
- B. Shop Drawings: Provide written statement of Approval from the AHJ for the Shop Drawings as described below.
- C. Close-out Submittals:
  - 1. Provide certification from the Contractor's civil engineer that the seismic supports under this section are installed according to the AHJ approved shop drawings and that they meet the requirements of IBC Chapter 16.

#### **1.5 SHOP DRAWINGS**

- A. Submit shop drawing showing seismic supports. Provide reference at each support location to a detail of the specific seismic support that will be utilized at that location.
- B. Submit calculation worksheets that support the selection of each anchor or support.
- C. Submit the above to the Authority Having Jurisdiction and obtain a written statement of Approval of the proposed system. This Approval shall be submitted to the Contracting Agency.

### **PART 2 - PRODUCTS**

#### **2.1 MATERIAL - GENERAL**

- A. Approved Manufactures:
  - 1. Acceptable manufacturer's of support brackets and hangars: "Unistrut", "Kindorf", "B-line", or as approved.
  - 2. "Caddy" fasteners are permitted for support of conduit to concealed metal studs and for conduit concealed above suspended acoustical ceilings.
  - 3. Provide hot-dip galvanized or stainless steel for all supporting devices located outdoors or in areas subject to moisture.

#### **2.2 STRUT**

- A. Provide steel U-channel strut for use in heated indoor areas. For installations that will be finish painted as part of the project, factory finish of the strut shall be paintable galvanizing, or phosphatized and primed. Provide galvanized factory finish of the strut for installations that will not have a painted finish.
- B. Provide steel strut with hot-dip galvanized finish for outdoor installation of galvanized conduits and boxes. All field-cut ends and other breaks in the finish shall be thoroughly treated with cold galv touch-up compound (Z.R.C. or accepted equal).

#### **2.3 HARDWARE COMPOSITIONS AND FINISHES**

- A. In dry indoor areas, all threaded fasteners and associated hardware shall be steel, with a zinc or cadmium-plated finish.

- B. In general, fasteners in outdoor, damp, or corrosive environments shall be of the largest trade size that will fit the item being fastened, shall have the coarsest threads commercially available in that size, and shall be hot-dip galvanized steel. Zinc electroplate will be acceptable only in the smaller sizes where hot-dip galv is not commercially available. On metal construction, install with the full length of the threads and the hole wet with cold galv touch-up compound (Z.R.C. or accepted equal).

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Hanger rods with spring steel fasteners may be used for 1-1/2 inch EMT and smaller conduits in dry locations.
- B. Support cable trays, multi-conduit runs, etc., by double rods at each point of support and be supported independently of any other building system.
- C. Do not support raceways or equipment from ceiling tie wire or T-Bar, piping or ductwork. Support independently. Exceptions: Outlet boxes located in suspended ceiling systems (e.g., ceiling speaker boxes) as specifically noted in Section 16131 and light fixtures as specifically noted in this Section.
- D. Surface mounted lighting fixtures supported from T-bar grid shall be attached to the grid with a positive clamp device that completely surrounds the supporting member similar to Caddy "IDS". Provide safety wires as specified in the foregoing.
- E. Secure boxes, wall brackets, cabinets, and hangers by means of toggle bolts in hollow masonry; preset inserts or expansion bolts in solid masonry and concrete; machine screws, bolts or welding on metal surfaces; and wood or sheetmetal screws in wood construction. Powder-actuated fasteners shall not be used for component anchorage in tension applications. Obtain permission before using any type of powder powered studs.
  - 1. Support raceways on approved types of wall brackets, ceiling trapeze hangers, or malleable iron straps. "Perforated plumber's strap" not permitted as means of support.
- F. Structural attachments:
  - 1. Provide adequate backing at structural attachment points to accept the forces involved.
  - 2. Attachment to plaster or gypsum board not permitted unless specifically approved by the Contracting Agency on a case-by-case basis. Where approved, such attachment shall be by means of molly or toggle bolts.
- G. Fixture supports:
  - 1. For other than T-bar ceiling fixtures and for all fixtures weighting more than 20 pounds, support luminaires from structural members capable of supporting total weight, under seismic conditions and independently from wiring system. Attach to steel members by approved beam clamps and rods.
- H. Pendant Fixtures:
  - 1. Loop and hook or swivel hanger assemblies for pendant fixtures shall be fitted with a restraining device to hold the stem in the support position

during earthquake motions. Pendant-supported fluorescent fixtures shall also be provided with a flexible hanger device at the attachment to the fixture channel to preclude breaking of the support. The motion of swivels or hinged joints shall not cause sharp bends in conductors or damage to insulation.

- I. Assembly Mounted Outlet Box:
  - 1. A supporting assembly that is intended to be mounted on an outlet box shall be designed to accommodate mounting features on 4-inch boxes, 3-inch plaster rings, and fixture studs.
- J. Wall-Mounted Emergency Light Unit:
  - 1. Each wall-mounted emergency light unit shall be secured in a manner to hold the unit in place during a seismic disturbance. Provide 16 x 16 inch 16 gauge galvanized sheet metal backing behind plaster or gypsum board to securely mount fixture flush to wall.
- K. Safety wires:
  - 1. Attach safety wires to lighting fixtures so that no part of the fixture, in event of ceiling suspension system failure, will drop more than 6 inches below normal ceiling height. Each end of each wire shall be secured with a minimum of three tight wraps.
  - 2. Provide safety wires (a minimum of two 12 gauge hangers) or equivalent aircraft cable for each pendant mounted fixture. Hangers or cable shall be securely attached to fixture, then routed through stem and securely attached to structure.
  - 3. Provide safety wires (a minimum of two 12 gauge hangers) or equivalent chains for each light fixture weighing less than 20 pounds installed in T-Bar or other ceiling suspension systems. Safety wires and chains shall be securely attached to diagonally opposite corners of each fixture and to structure.
- L. Provide equipment supported by flexible isolation mounts with earthquake restraining supports positioned as close to equipment as possible without contact in normal operation (earthquake bumpers).

**END OF SECTION 16190**



## **SECTION 16440**

### **DISCONNECTS**

#### **PART 1 - GENERAL**

##### **1.1 DESCRIPTION**

- A. This section describes general requirements, products, and methods of execution relating to fusible and non-fusible disconnecting devices approved for use on this project.

##### **1.2 QUALITY ASSURANCE**

- A. Devices shall be of the latest approved design as manufactured by a nationally recognized manufacturer and in conformity with U.L. listings and the governing NEMA standards.
- B. Disconnects shall be of the same manufacturer as switchboards and panelboards.

##### **1.3 SUBMITTALS**

- A. Provide submittals for all products in accordance with Section 16010 and Division 1.

#### **PART 2 - PRODUCTS**

##### **2.1 SAFETY SWITCHES**

- A. Safety switches, fusible and non-fusible, shall conform to NEMA Standard KS1 for type HD (Heavy Duty) unless otherwise noted.
  - 1. Switch Interior: All switches shall have switch blades that are fully visible in the OFF position when the door is open. Switches shall be of dead-front construction with permanently attached arc suppressers. Lugs shall be UL listed for copper and/or aluminum cables and be front removable.
  - 2. Switch Mechanism: Switches shall have a quick-make and quick-break operating handle and mechanism that shall be an integral part of the box, not the cover. Switches shall have a defeatable dual cover interlock to prevent unauthorized opening of the switch door in the ON position or closing of the switch mechanism with the door open. The switch shall be capable of being locked in the OFF position with three (3) padlocks.
  - 3. Enclosures: Switch enclosure shall be suitable for the environment in which the switch is mounted. NEMA 1 enclosure shall be code gauge, UL-98, sheet steel, treated with a rust inhibiting phosphate and finished in gray, baked enamel. Enclosures in damp, wet or exterior locations shall be NEMA 4X.
  - 4. Rating: Ampere, volt and horsepower ratings, as well as number of poles and presence of neutral bar shall be shown on the name plate.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Coordinate all details pertaining to size of motor and/or equipment, location and requirements to enclosure, ratings, etc., so as to provide the most suitable unit for the intended purpose.
- B. Provide nameplates for all disconnects. Coordinate names with mechanical equipment lists.
- C. Where the rating of a fused disconnect exceeds the ampacity of the conductors being protected, a permanent label noting maximum fuse size shall be installed in a conspicuous location within the switch.
- D. Where recommended or required by the equipment manufacturer, or required by underwriters' laboratories, disconnects shall be the fusible type, fused in accordance with the equipment nameplate information.
- E. Provide all code-required disconnects. For equipment which is under the jurisdiction of the IMC, a disconnect shall be provided within sight of the equipment.

**END OF SECTION 16440**

## **SECTION 16450**

### **GROUNDING**

#### **PART 1 - GENERAL**

##### **1.1 DESCRIPTION**

- A. This section describes general requirements, products and methods of execution relating to the furnishing and installation of a complete grounding system as required for this project.

##### **1.2 SUBMITTALS**

- A. Provide submittals for all products in accordance with Section 16010 and Division 1. Include copies of all catalog cuts, data sheets and other descriptive information for all specified materials.

##### **1.3 MINIMUM REQUIREMENTS**

- A. The minimum requirement for the system shall conform to Article 250 of the NEC.

##### **1.4 SPECIAL REQUIREMENTS**

- A. Unless specified elsewhere, the ohmic values for grounds and grounding systems shall be as follows:
  - 1. For grounding metal enclosures and frames for electrical and electronically operated equipment--5 ohms maximum.
  - 2. For grounding systems to which electrical utilization equipment and appliances are connected--5 ohms maximum.
  - 3. For grounding secondary distribution systems, neutrals, noncurrent carrying metal parts associated with distribution systems, and enclosures of electrical equipment not normally within reach of other than authorized and qualified electrical operating and maintenance personnel -- 10 ohms maximum.

##### **1.5 TELECOMMUNICATIONS GROUNDING SYSTEM**

- A. Telecommunications ground systems shall be provided as shown on the Contract Drawings and as related herein.
  - 1. Telecommunication Bonding Backbone (TBB) - A copper conductor extending from the telecommunications main grounding busbar (TMGB) to each telecommunications grounding busbar (TGB).
  - 2. Telecommunications Main Grounding Busbar (TMGB) - The TMGB serves as a dedicated extension of the building grounding electrode system for telecommunications infrastructure. The TMGB is generally located in the main telecommunications entrance room or as shown on the drawings.
  - 3. Telecommunications Grounding Busbar (TGB) - A busbar placed in a convenient and accessible location in a Telecom Room (TR) that is connected back to the TMGB. All equipment served from the TR shall be connected to the local TGB.

4. Site grounding system - connecting the TMGB in each structure to the low resistance earth grounding system.

## 1.6 REFERENCE CODES AND STANDARDS

- A. The publications listed below form a part of this specification. The publications are referred to in the text by basic designation only, latest edition.

NUMBER	TITLE
ANSI/IEEE C2	National Electrical Safety Code
ANSI/NFPA 70	National Electrical Code
ANSI/TIA/EIA 606-A	Administration Standard for Commercial Telecommunications Infrastructure
ANSI/TIA/EIA-607	Commercial Building Grounding and Bonding Requirements for Telecommunications
IEEE C62.41	Recommended Practice on Surge Voltages in Low-Voltage Surge Protective Devices
IEEE C62.42	Guide for the Application of Gas Tube Arrester Low-Voltage Surge Protective Devices
IEEE Draft P1250 (D4)	Guide on Service to Equipment Sensitive to Momentary Voltage Disturbances
IEEE Std 1100	Recommended Practice for Powering and Grounding Sensitive Electronic Equipment
IEEE Std 142	Recommended Practice for Grounding of Industrial and Commercial Power Systems
IEEE STD 81	Recommended Guide for Measuring Ground Resistance and Potential Gradients in the Earth
NFPA 70	National Electric Code (NEC) - Codebook and Handbook
REA PE-33	(1985) Shield Bonding Connectors
UL 1449 Edition 2	Transient Voltage Surge Protection
UL 467 Edition 6	Grounding and Bonding Equipment
UL 497 Edition 5	Protectors for Paired Conductors for Communication Circuits
UL 497A Edition 1	Secondary Protectors for Communication Circuits
UL 497B Edition 1	Protectors for Data Communication and Fire Alarm Circuits

## **PART 2 - PRODUCTS**

### **2.1 EQUIPMENT**

- A. All grounding conductors, ground rods, and equipment required for ground systems shall be listed for the purpose intended and approved by a Nationally Recognized Testing Laboratory (NRTL), and be in accordance with U.L. 467 and as follows:
  - 1. Ground rods shall be 3/4 inch by 10 foot copper-clad steel.
  - 2. Grounding conductors shall be copper.

### **2.2 CONNECTIONS**

- A. Joints in grounding conductors and mats below grade shall be made with exothermic welding process or hydraulically-crimped fittings listed for direct burial. Terminations above grade shall be made with solderless lugs, securely bolted in place unless noted otherwise on the drawings or telecommunications sections.
- B. Clamps, lugs, connectors, bonding bushings, and all other such grounding and bonding items shall be:
  - 1. Labeled or listed for the purpose.
  - 2. Shall be made (both body and hardware) of hot-dip galvanized steel, bronze, or other corrosion-resistant alloy (except bushing throats shall be plastic).
  - 3. Shall be the products of O-Z/Gedney, T & B, Raco, or accepted equals.
  - 4. In outdoor, damp, or corrosive environments, metals for these items shall be copper (with or without tin-plating), bronze, or other corrosion-resistant alloys only; O-Z/Gedney or accepted equal.

### **2.3 TELECOMMUNICATIONS SYSTEM BONDING**

- A. Bond all telecommunication equipment chassis, ladder racks, cable trays, conduits, equipment frames, cabinets, and all other telecommunication room and equipment room metallic components to a local TGB with green #6 AWG, 600 volt, insulated copper conductor.
- B. Bonding of grounding conductors shall be with the following methods as specified herein:
  - 1. Connections to grounding busses: Cool Amp Plating, field applied to both surfaces for all bolted and compression connections.
    - a. Approved gas tight two hole copper grounding compression lugs T&B 54205 series 2 hole, crimp Cool Amp plated compression type for connection to grounding busses.
    - b. Fasteners shall be nickel plated steel nuts, bolts and lockwashers.
  - 2. Conductor splices and connection to ground rods:
    - a. Cadweld exothermic welds. All bonds below grade shall be exothermic.

- b. Burndy type "YG" extruded wrought copper prefilled with Pentrox heavy duty compression connectors with probe holes (Type YGA and YGS not acceptable).

## **2.4 IDENTIFICATION AND LABELING**

- A. Grounding conductors shall be labeled in accordance with TIA/EIA-606-A.

## **PART 3 - EXECUTION**

### **3.1 EQUIPMENT GROUND**

- A. The raceway system shall be bonded in conformity with NEC requirements to provide a continuous ground path. Where required by Code or Ordinance or where called for on the plans an additional grounding conductor shall be provided, sized in conformity with Table 250.122 of the NEC, unless larger size is noted.
- B. Provide separate grounding conductor securely bonded and effectively grounded to the enclosures at both ends of all non-metallic raceways and all flexible conduit.
- C. Provide an equipment grounding conductor sized in conformity with Table 250.122 of the NEC, unless larger size noted, for all new feeder and branch circuit conduits. Where conductors are adjusted in size to compensate for voltage drop, equipment grounding conductors shall be adjusted proportionately according to circular mil area.
- D. Refeeder existing feeder/branch circuits that do not have an existing equipment grounding conductor: Bond equipment grounding conductor of new feeder or branch circuit to junction box and new and existing conduits.

### **3.2 CONCEALED CONNECTIONS**

- A. Permanent grounding connections, where permitted by the NEC to be concealed, shall not be so concealed until inspected and accepted by the Contracting Agency. Failure to comply with this requirement will make the Contractor liable for any expenses incurred in the process of re-exposing the connections for inspection, and subsequent repair and patching of the concealing construction, including the work of other trades. The Contractor shall schedule inspection of such connections at least one work week in advance of concealment, and will not be entitled to any additional compensation or time extension for delays caused by inability of the Contracting Agency's representative to be available at the desired time.

### **3.3 CORDS AND NONMETALLIC CABLES**

- A. Unless specifically permitted otherwise, all cords and nonmetallic cables shall be furnished with integral Code-sized grounding conductor. Securely bond all metal components and effectively ground the entire electrical system.

### **3.4 TELECOMMUNICATIONS GROUNDING SYSTEM**

- A. Telecommunications Main Grounding Busbar (TMGB):
  - 1. Equipment and metallic raceways located in the same room as the TMGB shall be bonded to the TMGB.
  - 2. Where a panelboard for telecommunications is located in the same room as the TMGB, the panelboards Alternating Current Equipment Ground (ACEG) bus or the enclosure shall be bonded to the TMGB.
- B. Telecommunications Grounding Busbar (TGB):
  - 1. Equipment and metallic raceways located in the same room as the TGB shall be bonded to the TGB.
- C. Bonding and Connections:
  - 1. General:
    - a. Cadweld or braze all concealed or below grade connections and at all ground rods.
    - b. All compression connections shall be made using a hydraulic 4 way compression die.
    - c. All compression connections shall be exposed.
    - d. All insulated wire splices shall be insulated with preformed wire covers.
- D. Identification and Marking:
  - 1. Show all conductors on neatly marked record drawings. Submit to the Contracting Agency.
  - 2. Grounding conductors shall be marked per ANSI/TIA/EIA 606-A and as directed by the Contracting Agency. Mark each cable end using tie wrap style cable markers.

### **3.5 EXTERNAL BONDING JUMPERS**

- A. Not permitted; all bonding jumpers shall be run inside the raceways for the circuits they serve.

### **3.6 SEPARATELY DERIVED SYSTEMS**

- A. Separately derived systems shall be grounded in accordance with NEC Article 250.30.
  - 1. Bonding jumper:
    - a. The bonding jumper shall be sized in accordance with NEC Table 250.66. Where the derived phase conductors are larger than 1100 kCMIL copper, the bonding jumper shall have an area that is not less than 12-1/2% percent of the area of the largest phase conductor.
    - b. The bonding jumper shall be used to connect the equipment grounding conductors of the separately derived system to the grounded conductor.

- c. The bonding jumper shall be located within the enclosure of the source of the separately-derived system, unless specifically noted otherwise.
- 2. Provide termination lugs for the co-located grounded conductor, grounding electrode conductor and bonding jumper terminations, using Listed compression-type connectors suitable for all conductors landed at each location.
- 3. The grounded conductor of the separately derived system shall be bonded to the nearest available point of the interior metal water piping system in the area served by the separately derived system. The bonding jumper shall be sized in accordance with NEC Table 250.66.
- 4. Grounding electrode:
  - a. The grounding electrode shall be as near as practical to and preferably in the same area as the grounding electrode conductor connection to the system.
  - b. The grounding electrode conductor, sized in accordance with NEC Table 250.66, shall be used to connect the grounded conductor of the derived system to the grounding electrode.
  - c. The grounding electrode shall be the nearest one of the following:
    - 1). Effectively grounded structural metal member of the structure.
    - 2). Effectively grounded metal water pipe within 5 feet from the point of entrance into the building.

**END OF SECTION 16450**



## **SECTION 16460**

### **SECONDARY TRANSFORMERS**

#### **PART 1 - GENERAL**

##### **1.1 DESCRIPTION**

- A. This section describes general provisions, products, and methods of execution relating to transformers approved for use on this project. Type, size, ratings, etc., shall be as shown on the plans and in accordance with UL and NEMA standards.
- B. Include all power and control transformers through 600 volts in this and other Divisions of specifications, including items such as: Control, communications systems, lighting and power, distribution and signal systems transformers, whether furnished as an integral component of an item of equipment or separately provided.

##### **1.2 QUALITY ASSURANCE**

- A. Transformers shall be of the latest approved design as manufactured by a nationally recognized manufacturer and be listed in the Underwriters' Laboratory and bear the UL label.
- B. The Basis of Design is equipment from Square D Company to set a standard for quality. Equipment from Cutler Hammer, Seimens Energy & Automation, General Electric or alternative systems will be considered providing that sufficient documentation is provided to satisfy the CONTRACTING AGENCY that the equipment meets the requirements of the specification.

##### **1.3 SUBMITTALS**

- A. Provide submittals for all products in accordance with Section 16010 and Division 1.
- B. Submit for approval manufacturers shop drawings to show weights, dimensions, mounting arrangements, interconnecting diagrams, and electrical power requirements. Furnish typical test data, including ratio, resistance, losses, sound level, applied voltage, induced voltage, temperature rise, impulse test, impedance, X/R ratio, transient inrush current and short circuit test.

#### **PART 2 - PRODUCTS**

##### **2.1 TRANSFORMERS**

- A. All transformers shall be dry-type.
- B. Except as specifically noted on the drawings, single phase transformers shall be 480 volt primary and 120/240 volt secondary. Three phase transformers shall be 480 volt delta primary and 208 wye volt secondary. Transformers 25 KVA and larger shall have a minimum of 4-2 1/2% full capacity primary taps (2 above normal and 2 below) unless otherwise noted.

- C. Transformers 15 KVA and larger shall be rated 115°C temperature rise above 40°C ambient, unless otherwise indicated on the drawings. Insulating materials shall be in accordance with NEMA ST20-1972 standards for a 220°C UL component recognized insulation system.
- D. Transformer coils shall be of continuous wound construction and shall be impregnated with non-hygroscopic, thermo-setting varnish.
- E. All cores to be constructed of high grade, non-aging silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Magnetic flux densities are to be kept well below the saturation point under all conditions of possible load. The core laminations shall be clamped together with structural steel angles. The complete core and coil shall then be bolted to the base of the enclosure but isolated there from by means of rubber, vibration-absorbing mounts. There shall be no metal-to-metal contact between the core and coil and the enclosure. On transformers 500 KVA and smaller, the vibration isolating system shall be designed to provide a permanent fastening of the core and coil to the enclosure. Sound isolating systems requiring the complete removal of all fastening devices are not acceptable.
- F. Transformers shall have a "K" factor as indicated on the "Power One Line". Transformers with a "K" factor of 13 or greater shall withstand 100% loading at 60 Hz, 33% of the fundamental at third harmonic current, 20% of the fundamental at the fifth harmonic current, and so on (harmonic amplitude =  $1/f$  times fundamental for all odd-order harmonics).
- G. Transformers 15 KVA and larger shall be in a heavy gauge, sheet steel, ventilated enclosure. The ventilating openings shall be designed to prevent accidental access to live parts in accordance with UL, NEMA, and National Electrical Code standards for ventilated enclosures. Single phase transformers 15 KVA through 167 KVA, and three phase transformers through 112.5 KVA shall be designed so they can be either floor or wall mounted. Larger transformers shall be designed only for floor mounting.
- H. The entire transformer enclosure shall be degreased, cleaned, phosphatized, primed, and finished with gray, baked enamel.
- I. The maximum temperature of the top of the enclosure shall not exceed 50°C rise above a 40°C ambient.
- J. The core of the transformer shall be visibly grounded to the enclosure by means of a flexible grounding conductor sized in accordance with applicable NEMA, IEEE, and ANSI standards.
- K. The transformer shall be listed by Underwriters' Laboratory for the specified temperature rise.

## 2.2 SOUND RATINGS

- A. Sound levels shall be guaranteed by the manufacturer not to exceed the following:
  - 1. 15 to 50 KVA: 45dB.
  - 2. 51 TO 150 KVA: 50dB.

- B. Replace transformers deemed excessively noisy by the Contracting Agency at no additional contract cost.

### 2.3 TRANSIENT INRUSH CURRENT

- A. Primary overcurrent protection for dry type step down transformers is based on basis of design manufacturer's published data for transient inrush current. If transformers submitted have higher inrush currents that require upsizing of circuit breakers, conduits, conductors, etc., the cost of these changes shall be borne by the Contractor. Basis of design inrush currents are as follows:

Transformer kVA	Transient Inrush Current (multiplier times full load current)
30	9.6
45	8.7
75	10.1

- B. If transient inrush current exceeds that of the specified transformers a complete coordination study shall be included with the submittals for the affected portions of the electrical systems, and all affected components (circuit breakers, conduits, conductors, etc.) shall be resized accordingly. Costs of changes due to higher inrush currents shall be borne by the Contractor.

### 2.4 TRANSFORMER SHIELDS

- A. All transformers with a "K" rating greater than one and other transformers as specifically noted on the drawings shall be supplied with a quality, full width electrostatic shield resulting in a maximum effective coupling capacitance between primary and secondary of 33 picofarads. With transformers connected under normal, loaded operating conditions, the attenuation of line noise and transients shall equal or exceed the following limits:

Common Mode:	0 to 1.5Hz - 120db; 1.5 to 10kHz - 90db; 10 to 100kHz - 65db; 100kHz to 40db.
Transverse Mode:	1.5 to 10kHz - 52db; 10 to 100kHz - 30db.

## PART 3 - EXECUTION

### 3.1 MOUNTING

- A. Provide all required structural provisions including floor, wall brackets, or trapeze suspended from structural members as indicated on drawings, or approved.
- B. Transformers up to 100 kVA: Mount transformers on double-deflection neoprene-in-shear isolators (no harder than 50 durometer) sized for the following static deflections:
- 0.2" static deflection for slab on grade installations.
  - 0.5" static deflection for other than slab on grade installations.

3. Mason Industries or as approved.

### **3.2 ADJUSTMENT**

- A. Adjust transformer taps to provide rated voltage at the secondary bus with all connected loads "on", except the no-load secondary line-to-neutral voltage shall not exceed 125 volts on nominal 120 volt phases. Submit log of final voltage and current readings at no load and full load.

### **3.3 ELECTRICAL CONNECTIONS**

- A. Liquid-tight flexible metal conduit with supplemental ground jumper shall be used for all transformer connections unless connections are routed underslab. The flexible conduit shall be installed in a slack, shallow "U" form and shall prevent rigid contact between the transformer components and the nearby structure, conduits, etc. The ground jumper in flexible conduits may be either within or bonded to the exterior of the conduit.

### **3.4 GROUNDING AND BONDING**

- A. Transformer wye secondaries shall be grounded as separately derived systems. Transformers and conduits shall be bonded per NEC requirements.

**END OF SECTION 16460**

## **SECTION 16470**

### **PANELBOARDS**

#### **PART 1 - GENERAL**

##### **1.1 DESCRIPTION**

- A. This section describes general provisions, products, and methods of execution relating to branch circuit panelboards approved for use on this project. Type, size, ratings, etc., shall be as shown on the plans and in accordance with UL Standards 50 and 67.

##### **1.2 SPECIAL REQUIREMENTS**

- A. Special features such as integral transient voltage surge suppression (TVSS), etc., shall be provided as required by this Section and as noted on the drawings or on the panel schedules.
  - 1. Trims shall be furnished to be compatible with type of mounting.
  - 2. "Door-in-door" construction shall be furnished on all panelboards unless otherwise noted.

##### **1.3 QUALITY ASSURANCE**

- A. The panelboards shall be of the latest approved design as manufactured by a nationally recognized manufacturer and be listed in the Underwriters' Laboratory and bear the UL label.
- B. The Basis of Design is equipment from Square D Company to set a standard for quality. Equipment from Cutler-Hammer, Seimens Energy & Automation, General Electric, or alternative systems will be considered providing that sufficient documentation is provided to the Contracting Agency that the equipment meets the requirements of the Specifications, and matches the Basis of Design on all points that are pertinent to the Project.

##### **1.4 SUBMITTALS**

- A. Provide submittals for all products in accordance with Section 16010 and Division 1.
- B. Submit for approval manufacturer's shop drawings to show weights, dimensions, mounting arrangements, interconnecting diagrams, schedules of all overcurrent devices, voltage ratings, and all specified accessories.

#### **PART 2 - PRODUCTS**

##### **2.1 CABINETS AND FRONTS**

- A. Panelboard assembly shall be enclosed in a steel cabinet. Fronts shall include doors and have flush, brushed stainless steel, cylinder tumbler-type locks with catches and spring-loaded door pulls. All panelboard locks shall be keyed alike. Fronts shall have adjustable, indicating trim clamps that shall be completely concealed when the doors are closed. Doors shall be mounted by completely concealed steel hinges. Fronts shall not be removable with door in

the locked position. A circuit directory frame and card with a clear plastic covering shall be provided on the inside of the door. The directory card shall provide a space at least 1/4 inch high by 3 inch long or equivalent for each circuit. The directory shall be typed to identify the load fed by each circuit. Fronts shall be of code gauge, full finished steel with rust-inhibiting primer and baked enamel finish. Cabinets shall be labeled in accordance with the drawings and Section 16010.

## **2.2 SAFETY BARRIERS**

- A. The panelboard interior assembly shall be dead front with panelboard front removed.

## **2.3 BUS ASSEMBLY**

- A. Panelboard bus structure and main lugs or main breaker shall have current ratings as shown on the panelboard schedule. Bus structure shall allow 1, 2 and 3-pole breakers of various frame sizes to be mounted in any location and in any combination up to the capability of the panel.

## **2.4 SHORT CIRCUIT CURRENT RATING**

- A. Each panelboard, as a complete unit, shall have a short circuit current rating (SCCR) equal to or greater than that shown on the panelboard schedule, or as necessary to comply with the requirements stated on the power one-line diagram. The SCCR rating shall not, in any case, be less than 10,000 Amps at 240 volts, and 14,000 Amps at 480 volts.

## **2.5 PROTECTION DEVICES**

- A. Circuit breakers shall individually comply with Section 16475 - OVERCURRENT PROTECTIVE DEVICES. The type to be furnished shall be as shown on the plans. If no withstand rating is specified, minimum requirements shall be as necessary to comply with the preceding requirements.

## **2.6 NEUTRAL TERMINAL BAR**

- A. All panelboards shall be equipped with an insulated neutral terminal bar.
- B. Panelboards fed from "K-rated" transformers as noted on the drawings or further specified shall be equipped with 200% rated neutrals and neutral lugs and shall be U.L. Listed as suitable for non-linear loads.
- C. Panelboards with integral TVSS devices as noted on the drawings or further specified shall be equipped with 200% rated neutrals and neutral lugs and shall be U.L. Listed as suitable for non-linear loads.

## **2.7 EQUIPMENT GROUNDING TERMINAL BAR**

- A. All panelboards shall be equipped with an equipment grounding terminal bar to terminate equipment grounding conductors.

## 2.8 HANDLE LOCK-OFF EQUIPMENT

- A. Circuit breakers serving as the required disconnecting means for appliances or other equipment shall be equipped with equipment to allow the breaker to be padlocked in the "off" position.

## 2.9 INTEGRAL TVSS DEVICES

- A. Provide panelboards with integral TVSS devices as noted on the panel schedules or drawings in accordance with Specification Section 16471 - Transient Voltage Surge Suppression.
- B. Integral TVSS devices shall be factory installed in the panelboard.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Verify mounting arrangements for each location shown on the plans. Where cabinets are recessed, verify adequate thickness of wall and make arrangements for furring or trim as required. In general, all conduits shall enter the top or bottom of panel.
- B. Provide additional wire gutters or pull boxes to facilitate orderly entry of conduits into cabinets. Bundle and support wires and arrange them in an orderly manner in the designated wire gutters.
- C. Panelboards shall not be used for pull boxes for wiring not terminating in the panelboard.

### 3.2 SPARE CONDUITS

- A. Provide spare conduits from flush mounted panels into accessible ceiling or floor spaces as follows:

No. of Poles (Spares + Spaces)	Spare Conduits
1 - 3	One 3/4 inch
4 - 6	Two 3/4 inch
7 or more	Two 3/4 inch, One 1 inch

### **3.3 PANELBOARD LABELS**

- A. In addition to applicable NEC requirements for emergency systems, series rated applications, etc., label panelboards in accordance with Section 16010 – Electrical General Requirements.
1. First line shall be panelboard name.
  2. Second line shall be voltage and phase.
  3. Third line shall indicate if panelboard is "NORMAL" (black background), or "STANDBY" (yellow background) or "EMERGENCY" (red background).

**END OF SECTION 16470**



## **SECTION 16471**

### **TRANSIENT VOLTAGE SURGE SUPPRESSION**

#### **PART 1 - GENERAL**

##### **1.1 DESCRIPTION**

- A. This specification describes requirements for the Transient Voltage Surge Suppression (TVSS) devices for the protection of AC electrical circuits from the effects of lightning induced currents, substation switching transients and internally generated transients resulting from inductive and/or capacitive load switching. The TVSS devices shall be suitable for application in a Category C3 and B3 environment as described in ANSI/IEEE C62.41.

##### **1.2 SCOPE**

- A. Provide all labor, materials, equipment and services necessary for and incidental to the installation of the TVSS System devices as specified herein. All installations shall be completed in accordance with this specification.
- B. Provide TVSS for panelboards as indicated on the panelboard schedules or drawings.

##### **1.3 SPECIAL REQUIREMENTS**

- A. Where this specification or Specification Section 16470 - Panelboards specify a TVSS device integral to a panelboard, the TVSS shall be installed, delivered, and warranted by the electrical distribution equipment manufacturer at the factory.

##### **1.4 WARRANTY**

- A. The TVSS shall have a warranty period of five years, incorporating unlimited replacements of module if destroyed by transients during the warranty period.

##### **1.5 SUBMITTALS**

- A. Provide submittals for all products in accordance with Section 16010 and Division 1.
- B. Provide submittal data with the following information:
  - 1. Product data and manufacturer's installation instructions.
  - 2. Dimensional drawing of each suppressor type indicating mounting arrangements.
  - 3. UL 1449, 2<sup>nd</sup> Ed., SVR test data for TVSS devices.
  - 4. UL 1283, 3<sup>rd</sup> Ed., Noise Attenuation for TVSS devices.
  - 5. NEMA LS1- 1992, 3<sup>rd</sup> party testing for TVSS devices.

##### **1.6 CODES AND STANDARDS**

- A. U.L. compliance and labeling: Each complete suppression device shall be listed per U.L. 1449 (second edition) as a transient voltage surge suppressor.

- B. TVSS shall be designed to allow installation in accordance with current National Electrical Code.
- C. ANSI/IEEE C62.41, Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits, Category B and C.
- D. NEMA LS-1, Low Voltage Surge Protective Devices.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Acceptable manufacturers include: Advanced Protection Technologies, Current Technology, Liebert, Square D, or approved equal. The manufacturer shall be regularly engaged in the manufacture of TVSS devices for ANSI C62.41 B and C exposure categories for at least five years. Specific products are subject to approval.
- B. Where TVSS devices are specified as an integral part of distribution equipment, the manufacturer of the TVSS device shall be partnered with the distribution equipment manufacturer in providing a UL listed device.

### **2.2 TVSS DEVICES GENERAL**

- A. TVSS shall be compatible with the electrical system voltage, current, configuration and intended application.
- B. TVSS shall be parallel in design.
- C. TVSS shall be modular in design and MOV based. Each MOV shall be rated at 100kA each. Replacement of components is not acceptable. Each surge current diversion module shall be fused with 200,000 AIR rated fuses. Provide one spare module for each unit.
- D. TVSS shall have a maximum continuous operation voltage (MCOV) not less than 115% of the nominal RMS voltage continuously without degradation. For example, devices that use 130V MOVs for 120V systems are not acceptable.
- E. TVSS shall provide both visual and audible indication of properly performing protection for each phase.
- F. The TVSS device EMI-RFI noise rejection or attenuation value is measured in accordance with the procedures outlined in NEMA LS 1-1992/MIL 220A. Noise Filter Capability (100KHz, 1MHz, 10MHz and 100MHz) Max -44db attenuation.
- G. TVSS shall provide full cycle tracking circuitry to provide tight transient clamping regardless of the transient position on the sine wave.
- H. TVSS modules shall be fused and TVSS shall be capable of safely interrupting the power system's available fault current.
- I. TVSS shall incorporate a low impedance surge diversion platform for the surge current path. The surge current shall be symmetrically disbursed to all suppression elements to insure equal stressing and maximum performance of the suppression elements. The surge diversion platform shall provide equal impedance paths to each suppression element for shunting of high frequency

surges. The surge current diversion modules shall be bolted directly to the platform to insure reliable low impedance connections. Small gauge round wiring or plug-in connections shall not be used in the path for surge current diversion.

- J. TVSS shall have one or two fuses per phase, a Surge Rated Fuse in combination with thermal fuse technology. Fuses included in surge path for NEMA LS-1 single impulse testing.

## **2.3 BRANCH PANELBOARD TVSS DEVICES**

- A. TVSS shall be tested against ANSI C62.41 Category B3 impulse and Category B3 ringwave transients.
- B. TVSS shall be capable of surviving 5000 sequential ANSI C62.41 B3 impulses, without failure or degradation of UL 1449 suppressed voltage rating by more than 10%.
- C. TVSS shall have a maximum single impulse current rating of 65kA per mode.
- D. TVSS shall provide protection in the following modes and TVSS shall have a U.L. 1449 suppressed voltage rating (SVR) or clamp rating as follows:

Nominal Voltage	Configuration	L-N	N-G	L-G	L-L
120/208	Grounded Wye	500	500	500	800

- E. Provide overcurrent protection and a means of disconnect for the TVSS. Overcurrent and disconnect devices shall be exclusively utilized for TVSS. Size overcurrent protection in accordance with manufacturer's recommendations.

## **2.4 TVSS DEVICES INTEGRAL TO DISTRIBUTION EQUIPMENT**

- A. TVSS shall be Component Recognized in accordance with UL 1449, Standard for Safety, Transient Voltage Surge Suppressors.
- B. The TVSS diagnostic monitoring devices shall be mounted on the front of the distribution equipment enclosure.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Provide TVSS devices integral to panels as indicated on the panel schedules or drawings and in accordance with Specification Section 16470 - Panelboards. Where TVSS devices are specified as an integral part of the distribution equipment, they shall be installed as follows:
- TVSS shall be installed by and shipped from the electrical equipment manufacturer's factory.

**END OF SECTION 16471**

**SECTION 16475**  
**OVERCURRENT PROTECTIVE DEVICES**

**PART 1 - GENERAL**

**1.1 SECTION INCLUDES**

- A. Thermal Magnetic Molded Case Circuit Breakers - Furnish as specified herein and where shown on the associated schedules and/or drawings.
- B. Fusible switches and fuses - Furnish as specified herein and where shown on the associated schedules and/or drawings.

**1.2 REFERENCES**

- A. The circuit breaker(s) referenced herein shall be designed and manufactured according to the latest revision of the following standards.
  - 1. NEMA AB 1 - (National Electrical Manufacturers Association) Molded Case Circuit Breakers and Molded Case Switches.
  - 2. UL 489 - (Underwriters Laboratories Inc.) Molded Case Circuit Breakers and Circuit Breaker Enclosures.
  - 3. UL 943 - Standard for Ground Fault Circuit Interrupters.
  - 4. CSA C22.2 No. 5.1 - M91 - (Canadian Standard Association) Molded Case Circuit Breakers.
  - 5. Federal Specification W-C-375B/GEN - Circuit Breakers, Molded Case; Branch Circuit and Service.
  - 6. Federal Specification W-C-865C - Fusible Switches.
  - 7. National Fire Protection Association NFPA - 70 (National Electrical Code).

**1.3 QUALITY ASSURANCE**

- A. Devices shall be the latest approved design as manufactured by a nationally recognized manufacturer and in conformity with applicable standards and UL listings.
- B. The Basis of Design is equipment from Square D Company to set a standard for quality. Equipment from Cutler-Hammer, Seimens Energy & Automation, General Electric, or alternative systems will be considered providing that sufficient documentation is provided to the Contracting Agency that the equipment meets the requirements of the Specifications, and matches the Basis of Design on all points that are pertinent to the Project.

**1.4 SUBMITTALS**

- A. Provide submittals for all products in accordance with Section 16010 and Division 1.
- B. Provide outline drawings with dimensions, and ratings for voltage, amperage and maximum interruption. Include instructions for circuit breaker mounting, trip unit functions and adjustments, trouble shooting, accessories and wiring diagrams.

- C. Coordination data to check protective devices: Manufacturer shall provide electronic and hard copy time/current characteristic trip curves (and  $I_p$  &  $I^2t$  let through curves for current limiting circuit breakers) for each type of circuit breaker.
- D. Provide information required to verify compliance with the short-circuit withstand and interrupting ratings, as shown on the Drawings or further stated in these Specifications.

## **1.5 QUALIFICATIONS**

- A. To be considered for approval, the manufacturer shall furnish products listed by Underwriters Laboratories Incorporated (UL), or testing firm acceptable to the authority having jurisdiction as suitable for application specified.
- B. The overcurrent protection device manufacturing facility shall be Registered by Underwriters Laboratories Inc. to the International Organization for Standardization ISO 9000 Series Standards for quality.

## **PART 2 - PRODUCTS**

### **2.1 MOLDED CASE CIRCUIT BREAKERS**

- A. General:
  - 1. Circuit breakers shall be constructed using glass reinforced insulating material. Current carrying components shall be completely isolated from the handle and the accessory mounting area.
  - 2. Circuit breakers shall have an over center, trip free, toggle operating mechanism which will provide quick-make, quick-break contact action. The circuit breaker shall have common tripping of all poles.
  - 3. The circuit breaker handle shall reside in a tripped position between ON and OFF to provide local trip indication. Circuit breaker escutcheon shall be clearly marked ON and OFF in addition to providing International I/O markings.
  - 4. The maximum ampere rating and UL, IEC, or other certification standards with applicable voltage systems and corresponding amp interrupting ratings shall be clearly marked on face of circuit breaker.
  - 5. Circuit breaker/circuit breaker combinations for series connected interrupting ratings shall be listed by UL as recognized component combinations. Any series rated combination used shall be marked on the end use equipment along with the statement "Caution - Series Rated System. \_\_\_\_\_ A Available. Identical Replacement Component Required".
  - 6. Circuit breakers shall be equipped with UL Listed electrical accessories as noted on the panel schedules and/or drawings. Circuit breaker handle accessories shall provide provisions for locking handle in the ON and OFF position.
  - 7. Circuit breakers shall be UL Listed for reverse connection without restrictive line and load markings and be suitable for mounting in any position.

8. Lugs shall be UL Listed to accept solid (not larger than #8 AWG) and/or stranded copper and aluminum conductors. Lugs shall be suitable for 75° C rated wire or 90° C rated wire, sized according to the 75° C temperature rating in the National Electrical Code.

**B. Thermal-Magnetic Circuit Breakers:**

1. Circuit protective devices shall be Square D molded case circuit breakers. Amp ratings and amp interrupting ratings (AIR) shall be as shown on panel schedules and/or drawings.
2. Circuit breakers shall have a permanent trip unit containing individual thermal and magnetic trip elements in each pole.
3. Thermal trip elements shall be factory preset and sealed. Thermal elements shall be factory calibrated to operate in a 40° C ambient environment.
4. Two- and three-pole circuit breakers shall have an internal common trip crossbar to provide simultaneous tripping. Circuit breaker frame sizes above 100 amperes shall have a single magnetic trip adjustment located on the front of the breaker that allows the user to simultaneously select the desired trip level of all poles.
5. Standard circuit breakers up to 250 amperes at 600 VAC shall be UL Listed as HACR type (except type FC, FI, KC, KI, Q2, Q2H and Q2-H).

## **2.2 FUSIBLE SWITCHES**

- A. Fusible switches shall be designed for individual mounting as specified in Section 16440 - Disconnects, or for panelboard mounting.
- B. Switches designed for panelboard mounting shall have the same properties as specified for the individually mounted switches.
- C. Switches shall conform to NEMA and UL 67 standards.
- D. Switches shall be used in conjunction with fuses as specified in the following in order to constitute a complete "Overcurrent Protective Device."

## **2.3 FUSES**

- A. Manufacturer: Shall be Bussmann
- B. Fuses shall be of the sizes and types indicated on the drawings, further described in these specifications, or as recommended by manufacturer of equipment served (as applicable). Fuses shall be capable of interrupting the prospective fault current. Furnish one complete set of spare fuses of each rating installed to the Owner. Provide fuse puller(s) for fuse sizes used.
- C. Fuses through 600 Amperes: Current limiting, time delay one-time fuse, 600 volt, UL Class, type as required by the application.
- D. Interrupting Rating: 200,000 rms amperes.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. Install circuit breakers in accordance with manufacturers' instructions, the National Electrical Code and applicable local codes.
- B. Size devices as shown and specified, or as required by the load being served.

#### **3.2 ADJUSTMENTS**

- A. Circuit breaker pick-up level and time delay settings shall be adjusted to values indicated on the drawings or schedules, or as instructed by the Contracting Agency, or as recommended by the manufacturer.

**END OF SECTION 16475**

## **SECTION 16485**

### **MOTOR STARTERS**

#### **PART 1 - GENERAL**

##### **1.1 DESCRIPTION**

- A. This section describes general requirements, products, and methods of execution relating to manual and magnetic motor starters provided in this and other Divisions. Overloads shall be furnished and installed in Division 16.

##### **1.2 QUALITY ASSURANCE**

- A. Equipment shall be of the latest approved design as manufactured by a nationally recognized manufacturer and in conformity with the governing standards.
- B. The Basis of Design is equipment from Square D Company to set a standard for quality. Equipment from alternative systems will be considered providing that sufficient documentation is provided to satisfy the CONTRACTING AGENCY that the equipment meets the requirements of the Specifications, and matches the Basis of Design on all points which are pertinent to the Project.

##### **1.3 SUBMITTALS**

- A. Provide submittals for all products in accordance with Section 16010 and Division 1.

#### **PART 2 - PRODUCTS**

##### **2.1 AC FRACTIONAL MANUAL STARTERS**

- A. The manual starter shall consist of a manually operated toggle switch equipped with red pilot light and melting alloy type thermal overload relay.
- B. Thermal unit shall be one-piece construction and interchangeable. Starter shall be inoperative if thermal unit is removed.

##### **2.2 AC MANUAL STARTERS--LINE VOLTAGE TYPE**

- A. Manual starters shall be constructed and tested in accordance with the latest published NEMA standards.
- B. The manual starters shall consist of a manually operated switch equipped with red pilot light and melting alloy type thermal overload relays in every phase conductor. Thermal units shall be one-piece construction and the starter shall be inoperative if any thermal unit is removed.
- C. Starters shall be furnished in a NEMA 1 general purpose enclosure unless otherwise indicated on the plans or required by the conditions of the area in which they are installed.



### **2.3 AC MAGNETIC STARTERS--LINE VOLTAGE TYPE**

- A. Motor starters shall be across-the-line magnetic type rated in accordance with NEMA standards, sizes and horsepower ratings.
- B. Starters shall be mounted in NEMA 1 general purpose enclosures unless otherwise indicated on plans or required by the conditions of the area in which they are installed.
- C. Starters shall be furnished with overload relays in every phase conductor and starters shall be inoperative if any overload unit is removed.
  - 1. Overload relays shall be the solid state type. Trip current rating shall be established by selection of overload relay and shall be adjustable (3 to 1 current range). The overload shall be self-powered, provide phase loss and phase unbalance protection, have a permanent tamper guard, and be ambient insensitive. Overload shall be standard trip (Class 20) and shall have a mechanical test function.
- D. Starters through NEMA size five (5) shall be equipped with double break silver alloy contacts. All contacts shall be replaceable without removing power wiring or removing starter from panel.
- E. Coils shall be of molded construction and shall be 120 VAC. Starters shall have a fused 120V control power transformer in enclosure, or alternatively on 120/208 volt systems, the power system neutral conductor may be utilized. In all cases, control power shall be disconnected by the starter disconnecting means, unless otherwise specifically approved.
- F. Starters shall be suitable for field-addition of at least four (4) auxiliary electrical interlocks of any arrangement, normally-open or normally-closed.
- G. All starters shall have enclosure-mounted red running pilot light and Hand-Off-Auto switch.

### **2.4 AC COMBINATION STARTERS WITH FUSIBLE DISCONNECT SWITCH OR CIRCUIT BREAKER**

- A. Combination starters shall be manufactured in accordance with the latest published NEMA standards, sizes and horsepower ratings.
- B. Disconnect switch combination starters shall consist of a visible blade disconnect switch and a motor starter.
- C. Combination starters shall be mounted in NEMA 1 general purpose enclosures unless otherwise indicated on the plans or required by the conditions of the area in which they are installed.
- D. The disconnect handle used on combination starters shall always be in control of the disconnect device with the door opened or closed. The disconnect handle shall be clearly marked as to whether the disconnect device is "on" or "off".
- E. Magnetic starters provided under all Divisions of the Specifications shall be in accordance with this Section.

### **PART 3 - EXECUTION**

#### **3.1 COORDINATION**

- A. Coordinate all details pertaining to the motor control equipment with the Division of these specifications where the equipment is specified.

#### **3.2 CONTROL WIRING**

- A. Control wiring and control devices shall be provided under the Specification Division in which the controlled equipment is specified. Coordinate all related work.

#### **3.3 CONNECTIONS**

- A. Provide liquid-tight flexible conduit connections to motors and other equipment subject to vibration where LFMC is an acceptable wiring method. Provide flexible conduit connections to motors and other equipment subject to vibration that is located in spaces used for environmental air (e.g. fan rooms). Minimum length 12".

#### **3.4 NAMEPLATES**

- A. Provide engraved nameplates for all starters. Coordinate names with mechanical equipment lists.

#### **3.5 REDUCED VOLTAGE STARTERS**

- A. Reduced voltage starters shall be provided for all motors larger than:

208 volts	25
	horsepower
460 volts	50
	horsepower

  - 1. This requirement shall apply to starters furnished in this Division and other Divisions of the specifications.
  - 2. Motors controlled by Variable Frequency Drives (VFDs) are not subject to this requirement.

#### **3.6 TWO SPEED STARTERS**

- A. Provide two speed starters for all two speed motors. Starters shall comply with the requirements of the equipment and motor manufacturers. Refer to Mechanical Equipment Lists for equipment with two speed motors.
- B. This requirement shall apply to starters furnished in this Division and other Divisions of the specifications.

**END OF SECTION 16485**

## **SECTION 16745**

### **TELECOMMUNICATIONS DISTRIBUTION SYSTEM (TDS)**

#### **PART 1 - GENERAL**

##### **1.1 DESCRIPTION AND GENERAL SPECIFICATIONS**

- A. Provide the equipment, materials, and labor to install the systems shown on the drawings and specified herein. This shall include (but not limited to) provision of all trenching and backfill, raceways, sleeves, boxes, gutters, shelves, enclosures, shelf and enclosure supports, backboards, equipment racks, line and low voltage wire and cable, patch cords, pull ropes (in unused conduits), terminal modules, panels, outlets, jacks, splices, connections, cable management, labeling, testing and all other material, equipment, and labor required to make the systems fully operational.
- B. The intent of this Specification is to place in working order a complete, fully tested and documented Category 5e telecommunications distribution system complying with the Codes and Standards referenced herein.

##### **1.2 RELATED SECTIONS**

16111	Conduit and Fittings
16747	Telecommunications Optical Fiber Distribution
16749	Local Area Network

##### **1.3 COORDINATION**

- A. The necessity to coordinate this work with the Department is emphasized. The Contractor shall be responsible for any omissions, delays and additional cost due to lack of coordination or approval from the same.
- B. Coordinate work with other contractors and trades. The layout and installation of the systems shown on the drawings and specified herein shall be coordinated such that all special requirements for telecommunications systems shall be provided and incorporated into the project. The systems to be coordinated shall include (but are not limited to) electrical raceway, grounding, fire rated assembly, lighting, power distribution, control and instrumentation, and labeling of cables, terminations, outlets, jacks, etc. Report all conflicts to the Contracting Agency.
- C. Downtime for existing systems shall be minimized. It is the responsibility of the Contractor to plan, coordinate, and execute installation activities so that facilities are not unduly interrupted. Periods of unavoidable interruption shall be less than 4 hours in duration and be prior approved by the Contracting Agency.

##### **1.4 CODES AND STANDARDS**

- A. Where a Nationally Recognized Testing Laboratory (NRTL) listing or classification exists for a product and the product is suitable for the purpose

specified and indicated, the product shall bear the appropriate marking indicating the listing or classification.

B. Where a UL Standard is in effect, equipment shall:

1. Meet that Standard.
2. Bear the UL Label.

## **1.5 SUBMITTALS**

A. The following shall be submitted in accordance with Section 16010 and Division 1 in sufficient detail to show full compliance with the specification:

1. Manufacturer's Catalog Data shall be submitted for the following items. Data shall include a complete list of parts, special tools, and supplies.
  - a. Copper Cable
  - b. Information Outlets
  - c. Terminal Modules
  - d. Patch Cords and other accessories
2. Manufacturer's Installations Instructions.
3. Labeling System: Coordinate with Department for the Owner's labeling conventions. Submit Project labeling system for approval.
4. Contractor qualifications and experience as specified in this Section.
5. Manufacturers Warranty as specified elsewhere in this Section, including all warranty provisions and procedures for Owner to follow to obtain warranty service.
6. Quality Assurance Plan: Contractor shall prepare a quality assurance plan which provides a detailed outline of all testing to be accomplished.
7. The Quality Assurance Plan shall include, as a minimum:
  - a. A schedule of when tests will be performed relative to installation milestones.
  - b. Specific test procedure that will be used.
  - c. A list of test equipment that will be used including manufacturer, model number, calibration certification, range and resolution accuracy.
  - d. A sample test report form with examples of data to be reported.
  - e. Test plan shall be submitted to the Owner for approval at least 30 days prior to the start of testing.

B. DELETE SUPERFLUOUS INFORMATION FROM SUBMITTAL DATA, SUCH AS MODEL NUMBERS AND OPTIONS FOR EQUIPMENT CONTAINED ON MANUFACTURER'S DATA SHEETS BUT NOT USED ON THIS PROJECT.

C. One copy of approved submittals shall be kept at the job site.

## **1.6 SHOP DRAWINGS**

- A. Work shall be laid out in advance. Shop drawings shall be submitted to the Department for approval before work begins.
- B. Shop Drawings shall include dimensioned layouts of telecom outlet locations in DBC enclosures and telecom conduit routing from DBCs to the appropriate telecom room as noted on the Drawings.

- C. Work under this section has been indicated on the Drawings in locations that should allow installation without interfering with the work of other trades; however, exact finish locations cannot be indicated. Therefore, locations of all work and equipment shall be verified to avoid interferences, preserve headroom and keep openings and passageways clear. Review the plans for the work of the other trades and coordinate adjustment of this work, the work of the other trade or both to achieve the best installation for the Owner without additional claims or charges. Shop Drawings shall reflect coordination of work under this Section with the work of other trades.

## 1.7 REFERENCE CODES AND STANDARDS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only, latest edition. The reference codes and standards are minimum requirements.

Reference	Title/Revision
ANSI/ICEA	Publication S-80-576
ANSI/IEEE C2	National Electrical Safety Code
ANSI/NFPA 70	National Electrical Code
ANSI/T1E1.7/92-004R	Electrical Protection Applied to Telecommunications Network Plant at Entrances to Customer Structures or Buildings
ANSI/TIA/EIA-568-B.1	Commercial Building Telecommunication Cabling Standard Part 1: General Requirements
ANSI/TIA/EIA-568-B.2	Commercial Building Telecommunication Cabling Standard Part 2: Balanced Twisted-Pair Cabling Standards
ANSI/TIA/EIA-569-A	Commercial Building Standards for Telecommunications Pathways and Spaces
ANSI/TIA/EIA-571	Environmental Considerations for Telephone Terminals
ANSI/TIA/EIA-606-A	Administration Standard for Commercial Telecommunications Infrastructure
ANSI/TIA/EIA-607	Commercial Building Grounding and Bonding Requirements for Telecommunications
ANSI/TIA/EIA-854-2001	A Full Duplex Ethernet Specification For 1000mbis/S (1000base-Tx) Operating Over Category 6 Balanced Twisted-Pair Cabling.
BELLCORE TR-EOP-000063	Bellcore Network Equipment Building Systems Generic Equipment Requirements
BICSI	Telecommunications Distribution Methods Manual

Reference	Title/Revision
CFR 47 Part 68	Connection of Terminal Equipment to the Telephone Network
FCC Part 15	Radio Frequency Devices
FCC Part 68	Connection of Terminal Equipment to the Telephone Network
IEEE	LAN Standards: 802.3; 802.4; 802.5; 802.6
IEEE C62.41	Recommended Practice on Surge Voltages in Low-Voltage Surge Protective Devices
IEEE C62.42	Guide for the Application of Gas Tube Arrester Low-Voltage Surge Protective Devices
IEEE Draft P1250 (D4)	Guide on Service to Equipment Sensitive to Momentary Voltage Disturbances
IEEE Std 1100	Recommended Practice for Powering and Grounding Sensitive Electronic Equipment (Emerald Book)
IEEE Std 142	Recommended Practice for Grounding of Industrial and Commercial Power Systems (Green Book)
IEEE Std 241	Recommended Practice for Electric Power Systems in Commercial Buildings (Gray Book)
IEEE Std 446	Recommended Practice for Emergency and Stand-by Power Systems for Industrial and Commercial Applications (Orange Book)
NTP 638 - 3031 - 300 STD	Northern Telecom Practice "Bonding and Grounding QCF-Type Bond Clamps Description and Installation"
UL 1283	Electromagnetic Interference Filters
UL 1449	Transient Voltage Surge Protection
UL 1459	Standard for Telephone Equipment
UL 1950	Standard for Information Technology Equipment, Including Electrical Business Equipment
UL 467	Grounding and Bonding Equipment
UL 497	Protectors for Paired Conductors for Communication Circuits
UL 497A	Secondary Protectors for Communication Circuits
UL 497B	Protectors for Data Communication and Fire Alarm Circuits
UL 910	Safety Test for Flame-Propagation and Smoke Density Values for Electrical and Optical- Fiber Cables

## **1.8 QUALITY ASSURANCE**

- A. Perform all Work in accordance with all regulatory rules and regulations as well as references in this specification.
- B. Perform all Testing in accordance with ANSI/TIA/EIA-568-B specifications and submit all printed reports.

## **1.9 QUALIFICATIONS**

- A. The telecommunications work specified in this Section is acknowledged to require special skills mastered by education, experience, or both. Bidders for telecommunications work described in this Section shall be specialty telecommunications contractors, who may be a division of the Division 16 Subcontractor.
- B. Contractor Certification:
  - 1. This subcontractor shall be a certified installer of the cabling system, pre-qualified by the Manufacturer for the purpose of offering the Extended System Warranty as required in this Section.
  - 2. Provide a signed statement indicating that the subcontractor has the ability to provide the service required by the Contract Documents using factory trained and qualified technicians for each major system type and intends to maintain that capability until the end of the guarantee period.
- C. Contractor Experience:
  - 1. Specialty subcontractors bidding telecommunications work shall have a minimum of five years experience in the construction, testing, and servicing of systems of the type and magnitude specified herein.
  - 2. Specialty subcontractors shall have completed at least three projects equal or larger in size than this project within the past five years.
  - 3. Submit three experience projects and a list of the tools and test equipment (indicating ownership) expected to be used on this project within 30 days of award to demonstrate experience and access requirements.
  - 4. For each experience project submitted, provide the following information:
    - a. Project name
    - b. Project location
    - c. Date of completion
    - d. Owner
    - e. Owner's representative and phone number
    - f. Description and dollar value of each installed system
    - g. Name and specific responsibility of each subcontractor or employee involved with the project

5. For each experience project submitted, include a brief description of the system types provided and the name of the personnel directly responsible for the design (if required, and to what extent), specification, ordering, installation, programming, testing, demonstration, and overall system coordination for each of the following system types:
    - a. Penetrating Fire Rated Assemblies
    - b. Telecommunications General Requirements
    - c. Telecommunications Cable Pathway
    - d. Telecommunications Distribution System
    - e. Telecommunications Identification and Labeling
    - f. Telecommunications Testing
- D. Personnel and Equipment:
1. Specialty subcontractors shall have direct access to all tools and test equipment required to complete the telecommunications work when the work is bid.
  2. Submit the names of the specialty subcontractor's personnel to be assigned to this project and the specific responsibility of each. If these names are not the same as the names included with the experience projects required above, submit additional experience projects to demonstrate the required experience of those to be assigned to this project on other telecommunications projects of similar size and magnitude.
  3. The specialty subcontractor's project superintendent (in office) and foreman (field) shall have five years experience at the superintendent and foreman levels, respectively, on completed telecommunications projects of like magnitude and complexity.
  4. Demonstrate and document to the extent necessary that sufficient physical and personnel resources are available to accomplish the telecommunications work of this project without endangering timely and proper completion of the work.

#### **1.10 REGULATORY REQUIREMENTS**

- A. All Work shall conform to the requirements of NFPA 70 and all local amendments.
- B. All Work shall conform to the requirements of all Federal, State and Local Electrical and Telecommunications Regulations.

#### **1.11 SPECIAL WARRANTY**

- A. The warranty shall extend from the date of Substantial Completion to the longer of twenty (20) years or the length of the Extended Warranty offered by the successful manufacturer.
- B. The warranty shall be extended to the Department via the manufacturer through a single point of contact and shall be fully backed by the manufacturer.



- C. The Extended Product Warranty and System Assurance Warranty for this wiring system shall be provided consisting of the following:
1. Extended Product Warranty - The Extended Product Warranty shall ensure against product defects, that all approved cabling components exceed the specifications of ANSI/TIA/EIA 568-B and ISO/IEC IS 11801-B, exceed the attenuation and NEXT requirements of ISO/IEC IS 11801-B for cabling links/channels, and that the installation will exceed the loss and bandwidth requirements of ISO/IEC IS 11801-B for links/channels. The warranty shall apply to all passive Telecommunication Distribution System (TDS) components.
  2. System Assurance - The System Assurance shall cover the failure of the wiring system to support any existing application, as well as additional application(s) introduced in the future by recognized standards or user forums that use the ANSI/TIA/EIA 568-B or ISO/IEC IS 11801-B component and link/channel specifications for cabling.
  3. All communications system components shall be rated for end-to-end system Category 5e or greater performance levels on all pair combinations and warranted to support any existing or future applications which are designed to operate over a 100MHz horizontal channel (as defined in ANSI/TIA/EIA 568-B.2.1), to include support of the following applications. Performance shall be guaranteed under the Special Warranty at 100 meters (328 feet):
    - a. IEEE 802.3 10Base-T, 100Base-TX and 100Base-T4
    - b. IEEE 802.5 16 Mbps token ring
    - c. IEEE 802.12 Demand Priority Access Control
    - d. Asynchronous Transfer Mode (ATM) data transmission at 155 Mbps.
    - e. IEEE 802.3ab 1000Base-T.
    - f. ANSI/TIA/EIA-854-2001 "A Full Duplex Ethernet Specification For 1000mbis/S (1000base-TX) Operating Over Category 5e Balanced Twisted-Pair Cabling"
    - g. Future applications that become certified under the applicable standards as noted above
  4. Extended Product Warranty - The Extended Product Warranty and the System Assurance shall cover the replacement or repair of defective product(s) and labor for the replacement or repair of such defective product(s).
    - a. In the event this specialty subcontractor is unable to perform, goes out of business or ceases to exist, the manufacturer shall be responsible for identifying a new contractor to assume the warranty work.
    - b. Manufacturers shall bear full responsibility for the work of their certified installer, including all aspects of the design and installation.
    - c. In the event this specialty subcontractor fails to provide satisfactory warranty support, the manufacturer shall be responsible for taking all necessary remedial steps including finding a new contractor to provide warranty work.

- 5. System Certification - Upon successful completion of the installation and subsequent inspection, the customer shall be provided with a numbered certificate, from the manufacturing company, registering the installation.
- D. Submit a summary of warranty highlighting major features. Clearly disclose all exceptions to the requirements of this document, and specifically indicate any and all provisions that could potentially void the warranty or reduce its benefit to the Owner.
- E. The only Warranty program approved as meeting the specified warranty requirements is the Krone TrueNet Warranty Program because of the previously installed base of horizontal cabling and related equipment. Final approval is subject to Department review and approval of the Warranty:

#### **1.12 MANUFACTURERS' RECOMMENDATIONS**

- A. All installation procedures shall be in accordance with the recommendations of the manufacturer of the material being installed. Printed copies of these recommendations shall be submitted to the Contracting Agency 30 days prior to installation. Installation of the item shall not proceed until the recommendations are received and approved by the Contracting Agency. A copy of the recommendations shall be kept at the job site.

#### **1.13 TERMINOLOGY**

- A. "ACS" shall refer to the Access Control System as specified elsewhere in these Specifications.
- B. "DBC" shall refer to an Access Control System DataBase Controller as specified elsewhere in these Specifications and as indicated on the Drawings.
- C. "ITB" shall refer to an Interface Termination Box (ITB) to terminate cabling from the door, power supplies and DBC (access controller).
- D. "TDS" shall refer to the Telecommunication Distribution System cabling and hardware infrastructure internal and external to a building or buildings used to transmit voice, video and data, etc.
- E. "Stations" shall refer to individual telephone or computers, or remote peripherals of those systems (e.g., printers, facsimile machines, modems, etc).
- F. "Outlets" shall refer to a group of receptacles or jacks at each DBC where the DBCs connect to the ACS network via the horizontal cabling and patch cords provided under this Specification.
- G. "Jacks" or "Ports" shall refer to the individual receptacles where DBCs connect to the ACS network via the horizontal cabling and patch cords provided under this Specification.
- H. "Station Cables" shall refer to the horizontal cables connecting the ACS managed switches in the Telecommunication Rooms that are specified elsewhere in these Specification to the jacks provided at the DBC enclosures.
- I. "Pathways" shall refer to conduits, sleeves, or cable-trays, which are employed to route backbone and station cables between telecommunications

- J. "Backbone Cables", "Riser Cables" or "Tie Cables" shall refer to copper cables 25-pair or more and optical fiber cables 6-strand or more, connecting main cross-connect facilities, intermediate cross-connect facilities and telecommunications rooms. These cables may include outside plant cables between buildings and riser cables between floors.
- K. "Equipment Rooms" (ER) or "Communication Equipment Rooms" (CER) shall refer to a special-purpose room that provides space and maintains a suitable operating environment for large communications and/or computer equipment. Main rooms may also be referred to as an MDF.
- L. "Telecommunications Rooms (TR)" shall refer to a floor-serving facility for housing telecommunications equipment, cable terminations and cross-connect wiring. This is the point at which station cables terminate. It may also be referred to as an IDF.
- M. "Terminal Blocks" shall refer to multiple punch down cable terminations.
- N. "Patch Panels" shall refer to rack or frame mounted multiple punch down cable terminations with RJ-45 style, 8P8C jacks on the face for "plug and play" cross connect capability.
- O. "Cable Management" shall refer to rings, troughs, gutters etc., mounted in conjunction with telecommunications distribution equipment and terminal blocks, for the orderly routing of cables, patch cords, etc.
- P. "LEC" shall refer to the Local Exchange Carrier providing telephone service to the facility.

#### **1.14 STORAGE AND HANDLING**

- A. Care shall be exercised in handling materials during construction. Damaged materials shall be repaired or replaced as directed by the Contracting Agency.

### **PART 2 - PRODUCTS**

#### **2.1 GENERAL**

- A. All materials shall be as specified, first quality, manufacturer's current production.
- B. The Basis of Design for copper cabling, connecting hardware, and related hardware in this section is Krone hardware with Krone cable as standards for quality and performance. Copper cabling, connecting hardware, and related hardware from other manufacturers will not be acceptable on this Project due to the existing installed base of cabling. All other manufacturers other than Krone will be rejected without review.
  - 1. There are no approved alternate cabling product manufacturers for this Project.
  - 2. There are no approved alternate connecting hardware product manufacturers for this Project:

- C. Products shall provide the standard of performance required under paragraph 1.1 and the Special Warranty above.

## **2.2 CABLE MANAGEMENT**

- A. Rack mounted cable management:
1. Vertical trough-type cable management for use with standard 7 foot equipment rack, shall be minimum 4 inches deep.
  2. Horizontal trough-type cable management shall be 3-1/2 inch wide with horizontal and vertical routing rings, with 2 inches by 1.5 inch cutouts for through cable routing.

## **2.3 IDC TERMINAL MODULES**

- A. Connecting blocks shall match cables punched down under block, i.e., 5-pair for 5-pair color scheme, 4-pair for 4-pair cable, 3-pair for 3-pair cable, etc. When six pair are used 2-3 pair connecting blocks shall be used. For 25-pair or larger, use the 5-pair for 5-pair color scheme. All hardware shall be rated for ANSI/TIA/EIA 568-B Category 5e ratings and installed in accordance with ANSI/TIA/EIA 568-B guidelines. Blocks shall be color coded according to drawings and documented in accordance with ANSI/TIA/EIA 606-A. Blocks shall be identified using clear label holders and labels. Blocks shall be UL Listed.
- B. Insulation Displacement Terminal Modules: Termination blocks shall be modular and scalable up to 500 pair termination assemblies. Provide a retaining trough between every column of termination blocks.
- C. Terminal Modules shall be IDC type mounting blocks and associated parts and shall support the system Category of the permanent channel hardware installed

## **2.4 INFORMATION OUTLETS/JACKS**

- A. Outlet Requirements
1. Configure single gang outlet information outlets in single, duplex, triplex, quad-plex, or six-plex jack arrangement, as indicated on the Drawings.
  2. Provide outlet faceplates with both top and bottom labeling positions.
  3. Provided blank module inserts for all unused module locations.
  4. Equipment: Wall Outlets shall be Krone faceplates.
  5. Surface mount boxes, where applicable, shall be available in single or dual gang versions, or surface mount boxes with side/bottom exits for one to twelve jack configurations.
- B. Jack Requirements
1. Jacks for Voice and Data:
    - a. Communications jacks shall consist of multi-position 8-pin modular (8P8C) jacks, utilizing T568A termination style.

## 2. Category 5e Jacks

- a. Jacks shall be manufactured by the same manufacturer as the modular patch panels.
- b. All Jacks shall conform to ANSI/TIA/EIA 568-B Commercial Building Telecommunications Cabling Standard, Horizontal Cable Section and shall meet or exceed the following electrical and mechanical specifications:
  - 1). Electrical Specifications: Jacks shall meet or exceed performance specifications for the Channel as defined by ANSI/TIA/EIA-568-B.
  - 2). Mechanical Specifications:
    - a) Plug Insertion Life: 750 insertions
    - b) Contact Force: 3.5 oz (99.2 g) minimum using FCC-Approved modular plug
    - c) Plug Retention Force: 30 lb (133 N) minimum between modular plug and jack
  - 3). Temperature Range: -40° to 150°F (-40° to 66°C)
  - 4). Comply with FCC Part 68
  - 5). ISO 9001 Certified Manufacturer
  - 6). Equipment: Ortronics TracJack outlet

## 2.5 PATCH CORDS

- A. Provide factory assembled Category 5e Modular Patch Cords for each assigned port on the patch panel. All cords shall conform to the requirements of ANSI/TIA/EIA 568-B Commercial Building Telecommunications Cabling Standard, Horizontal Cabling Section, and be part of the UL LAN Certification and Follow-up Program. Cords shall be equipped with an 8 pin modular connector on each end and the minimum length patch cord shall be provided in each instance, to make an orderly, manageable connection between the patch panels or equipment being cross-connected.
- B. Unless shown otherwise on the Drawings at each location, provide spare Patch Cords of each length and type in each telecommunications room, with "violet" or "purple" identified for ACS patching.
  1. Lengths of patch cords shall be as required to make a neat, workmanlike, and orderly installation.
- C. All patch cords shall be round, and consist of 23-AWG copper, stranded conductors, tightly twisted into individual pairs.
- D. Patch cords shall be manufactured by the manufacturer of the patch panels and jacks and meet or exceed the Channel performance defined by ANSI/TIA/EIA-568-B.
- E. UL or ETL Verified for ANSI/TIA/EIA 568-B Electrical Performance.
- F. The patch cord shall have exclusion features to prevent accidental polarity reversals and split pairs.

- G. UL Listed for Fire Safety.
- H. ISO 9001 Certified Manufacturer.
- I. FCC Compliant.

## **2.6 HORIZONTAL CABLES**

### **A. General**

1. Data cables shall be extended between the station location and its associated TR and shall consist of 4 pair, 23 gauge, UTP, and shall be terminated on the 8 pin modular jacks provided at each outlet. Cable jacket shall comply with Article 800 NEC for use as a non-plenum cable. The 4 pair UTP cable shall be UL Listed Type CM (non-plenum), Category 5e UTP, 4 Pair.
2. All cables shall conform to the ANSI/TIA/EIA 568-B Commercial Building Telecommunications Cabling Standard, Horizontal Cable Section, and be part of the UL LAN Certification and Follow-up Program.
3. Electrical Specifications:
  - a. DC resistance:  $28.6 \Omega/1,000 \text{ ft}$  ( $9.38 \Omega/100 \text{ m}$ ), maximum
  - b. DC resistance unbalance: 5%, maximum
  - c. Mutual capacitance @ 1 MHz: maximum pF/ft: meet or exceed the performance values specified in ANSI/TIA/EIA-568-B.
  - d. Delay skew: ns/100m [328 ft.]: meet or exceed the performance values specified in ANSI/TIA/EIA-568-B.
  - e. Worst pair attenuation, dB/100m [328 ft.]: meet or exceed the performance values specified in ANSI/TIA/EIA-568-B.
  - f. NEXT, dB at 100m [328 ft.]: meet or exceed the performance values specified in ANSI/TIA/EIA-568-B.2.
  - g. PSNEXT, dB at 100m [328 ft.]: meet or exceed the performance values specified in ANSI/TIA/EIA-568-B.2.
  - h. ELFEXT, dB at 100m [328 ft.]: meet or exceed the performance values specified in ANSI/TIA/EIA-568-B.2.
  - i. PSELFEXT, dB at 100m [328 ft.]: meet or exceed the performance values specified in ANSI/TIA/EIA-568-B.2.
  - j. Worst Pair Structural Return Loss (SRL), dB at 100m (328 ft.): meet or exceed the performance values specified in ANSI/TIA/EIA-568-B.2.
4. Cables shall meet or exceed Category 5e performance specifications for the Channel as defined by ANSI/TIA/EIA-568-B.2.
5. Environmental:
  - a. Storage temperature: 68° F to 122° F (20° C to 50° C)
  - b. Installation Temperature: 32° F to 122° F (0° C to 50° C)
  - c. Operating Temperature: 14° F to 140° F (-10° C to 60°
6. UL or ETL Verified for Category 5e Electrical Performance.
7. UL Listed for Fire Safety.
8. ISO 9001 Certified Manufacturer.
9. Equipment: KRONE TrueNet

## **2.7 LABELING**

- A. Provide machine printed labels for all patch panels, cables, outlets, etc., in accordance with ANSI/TIA/EIA-606-A. Provide labeling nomenclature in accordance with information on the drawings or Owner's labeling conventions. Submit labeling samples for all required applications.
- B. Machine Printed Label Requirements:
  - 1. PC Compatible
  - 2. Can save and modify files
  - 3. Fully integrated with AutoCAD
  - 4. Editable Fonts and Sizes
  - 5. Rotate Text and Objects
  - 6. Vary Line Spacing
  - 7. Ability to import graphical images
  - 8. Capable for customization of layout
  - 9. Re-positional labels
- C. Basis of Design:
  - 1. Brady Electrical/Datacomm Worldwide (latest version of LabelMark)
  - 2. Cable Management Software International (latest version of docIT)
  - 3. Approved alternate
- D. Enter all telecommunications circuit data into the Owner's existing cable management database.
- E. Labeling and color coding identification for this project shall conform to TIA/EIA-606-A for a Class 4 Administrative System.

## **2.8 UNSPECIFIED EQUIPMENT AND MATERIAL**

- A. Any item of equipment or material not specifically addressed on the drawings or in this document and required to provide a complete and functional TDS installation shall be provided in a level of quality consistent with other specified items.

## **PART 3 - EXECUTION**

### **3.1 GENERAL**

- A. Provide, connect and test all equipment and materials for the systems herein specified and shown on the Drawings. All wiring shall be neatly tied or laced in cabinets and terminated on terminal strips provided for the purpose. Each cable shall be identified by an approved marking system at each end.
- B. Outlet/Jacks shall be identified with machine printed labels. Hand lettered labels shall not be used.
- C. Provide labels and color-coded inserts for each jack at patch panels, in accordance with TIA/EIA-606-A.
- D. Provide full set of snap-in icons for workstation outlets for use by Owner to mark jacks for analog and digital telephones as two unique classes of data. Store icons in clear plastic bags in each IDF/MDF.

- E. Wherever materials, methods or placements of materials and equipment for the communications work is provided by other Subcontractors or the Owner, it shall be the responsibility of this specialty Subcontractor to coordinate that work and assure that it is provided in such a manner as to enhance the final system operation.
- F. Coordinate installation of lighting, ventilation and all other systems in the communication rooms to avoid interferences.
- G. Test the systems, demonstrate operation to the Department and provide training as specified.
- H. In each TR, IC, MDF, IDF and equipment room provide a minimum of a 30 inches by 42 inches CAD drawing indicating floor plan and telecommunication one-line. The floor plan shall indicate telecommunication outlets with the appropriate outlet designation indicated on the plan. Mount drawing beneath a sheet of 1/8 inch clear Plexiglas on wall. Provide marking pens attached with Velcro to facilitate marking when moves, adds, or changes occur. Plexiglass and floor plan shall be mounted in such a way as to allow easy and rapid updates to the underlying floor plan. Include all copper and optical fiber systems on this drawing.
- I. Work under this section shall be closely coordinated with work under other sections of the project.

### **3.2 COLOR CODE SYSTEM**

- A. Horizontal cables, patch cords, equipment cords, etc used for the ACS shall be colored "violet" or "purple" to differentiate them from other system's horizontal cables, patch cords, equipment cords, etc.

### **3.3 CODES AND PERMITS**

- A. Apply and pay for all fees, permits, and obtain serving utility and governmental approvals.
- B. Coordinate all work with the serving utility.
- C. Raceway fill requirements for communications systems shall be in accordance with ANSI/TIA/EIA-569-A and BICSI.
- D. NEC bending radius of all communications ducts, raceways, cabletrays, etc., shall be increased to not less than the installed cable manufacturer's recommendations, and the applicable ANSI and BICSI Standards.
- E. Communications work shall be in complete accordance with the following:
  - 1. National Electrical Code (NEC), latest legally enacted edition.
  - 2. Regulations of the State Fire Marshal.
  - 3. National Fire Protection Association (NFPA) Codes.
  - 4. All state, county and local codes and ordinances.



### 3.4 DELIVERY AND STORAGE

- A. Materials and Equipment shall be stored with protection from mechanical damage, weather, humidity and temperature variation, dirt and dust, and other contaminants.
- B. Materials shall be inspected and inventoried promptly upon receipt.
- C. Cables shall be tested immediately upon receipt and received or rejected and returned based upon testing or visual inspection.
- D. Report and record all serial numbers received and/or rejected.
- E. All inspection and testing shall be performed under the observation of the Department at the Department's option. Provide three (3) working days advance notice of tests.

### 3.5 LAYOUT

- A. All work shall be laid out in advance. Shop drawings shall be submitted to the Contracting Agency for approval before work begins. Maximum height for terminal blocks and patch panels shall be 6 feet-6 inches, minimum height shall be 1 foot-6 inches. Cables shall be racked and supported in a workmanlike fashion. All work shall be labeled according to ANSI/TIA/EIA 606-A, and color coded according to BICSI Standards. In the absence of details on the drawing governing the layout of terminations, the following guidelines shall apply.
  - 1. All horizontal cables from a common outlet shall terminate sequentially (in groups) on the same patch panel unless the cables are of different performance levels such as Category 5e and 6.
  - 2. Horizontal cables that are of different performance levels, such as Category 5e and 6, shall be terminated on different patch panels, and identified accordingly.
  - 3. Pairs from each cable shall be terminated sequentially from left to right, top to bottom starting with the lowest assigned number at the upper left hand corner of the frame.
  - 4. Trunk or riser cables shall terminate on dedicated terminal blocks, separate from but adjacent to horizontal terminal blocks. Cross-connect or patch cords longer than 18 feet shall be avoided. Install stress relief hardware where needed.
- B. Keep up to date "As-built" record drawings at each job site detailing the layout of all data racks and telephone, data and trunk terminations, including a typed listing of cables/rooms served by each terminal block and patch panel. Refer to Section 16010 for other Record Document requirements
- C. Layout Shop Drawings shall be prepared using CAD. Final approved Shop Drawings shall be updated with precise "as-built" conditions and shall be submitted with the Operations and Maintenance Manuals. File format shall be AutoCAD "DWG" or "DXF."

### 3.6 CABLE INSTALLATION

- A. If cable dimensions shown are exceeded, all cable pathways and supports shall be resized to maintain the original fill ratios based on the dimensions shown.
- B. Follow cable manufacturer's specification regarding handling methods, retaining/support methods, bending radius and maximum pulling tension limitations.
- C. Telecommunication cables shall not be installed in the same raceway as power cables.
- D. Cables shall be installed in a neat and orderly manner and shall not cross or interlace other cables except at breakout points.
- E. Cables in vertical trays shall be individually retained with straps at a maximum of 6 feet on center.
- F. Tie wraps shall not deform the cable insulation when tightened.
- G. All cables shall be routed to minimize EMI and RFI interference. All cable shall be routed according to the following table. Spacings are minimum for all Category 3 and higher cable.

Minimum Separation of Telecommunications pathways from 480 volt or less power lines

Condition	<2 kVA	2-5 kVA	>5 kVA
Unshielded power lines or electrical equipment in proximity to telecommunications open or nonmetal pathways.	5 in	12 in	24 in
Unshielded power lines or electrical equipment in proximity to telecommunications grounded metal conduit pathways	2.5 in	6 in	12 in
Power lines enclosed in a grounded metal conduit (or equivalent shielding) in proximity to a telecommunications grounded metal conduit pathway	N/A	3 in	6 in
Power lines enclosed in a grounded metal conduit (or equivalent shielding) in proximity to telecommunications open or nonmetal pathways.	2.5 in	6 in	12 in
Mechanical ductwork, metal floors and other metallic planes to	2 in		

Minimum Separation of Telecommunications  
pathways from 480 volt or less power lines

Condition	<2 kVA	2-5 kVA	>5 kVA
telecommunications open or nonmetal pathways.			
Mechanical ductwork, metal floors and other metallic planes to telecommunications open or grounded metal conduit pathways.	0 in		
Fluorescent or HID lighting fixtures	5 in	5 in	5 in

### 3.7 LUBRICANT

- A. Pulling lubricant, shall be used to minimize pulling tension and prevent sheath damage when pulling cables into ducts and conduits. Lubricant shall be applied to the cable sheath with a lubricator. When pulling has been completed, the exposed cable ends shall be wiped clean of lubricant.
- B. Lubricants shall be compatible with and intended for use with plastic-sheathed cables. Soap and grease type lubricants shall not be allowed.
- C. All equipment and the pulling set shall be checked to minimize interruptions once pulling begins. Cable shall be pulled without stopping until the required amount of the cable has been placed. When the pulling operation is halted before the pull is completed, the tension of the pulling line shall not be released. When pulling is resumed, the inertia of the cable shall be overcome by increasing the tension in small steps a few seconds apart until the cable is in motion. Cable shall be paid from the top of the reel by rotating the reel in the feed direction at the rate of pull. Cable shall not be stripped off the reel by pulling.

### 3.8 SEAL

- A. Ducts in which cable is placed shall be sealed with urethane foam duct seal. This material shall be inserted between the cable and the duct and in all unused ducts, in order to prevent damage to the cable sheath and to prevent the entrance of dirt or water into the manhole or vault.

### 3.9 DAMAGE AND DEFECTS

- A. Use a tension monitoring device to ensure that the maximum pulling tension that may be applied to the cable to be pulled into a conduit section is not exceeded. Provide replacement cable if cable manufacturer's maximum pulling tension is exceeded at any time during a pull.
- B. Cable shall be carefully inspected for sheath defects or other irregularities as it is paid out from the reel. When defects are detected, pulling shall stop immediately and the cable section shall be repaired or replaced at the discretion of the Department. A system of communications shall be

maintained between pulling and feed locations so that pulling can be stopped instantly, when required.

- C. Cable shall be hand guided through intermediate manholes and into the next duct section when making pull-throughs. Proper rigging shall be used in the intermediate manhole to keep the pulling line and cable aligned with the exit duct to prevent the line or cable from rubbing against the edge of the duct. Cables in pull-through manholes shall be set up and racked before the cable ends in adjacent manholes are set up and racked.
- D. Cable ends pulled into manholes, vaults, or terminal locations that are not to be racked or otherwise permanently positioned immediately shall be tied in fixed positions to prevent damage to the cables and provide adequate working space.
- E. Adequate care shall be exercised when handling and storing reels of cable to prevent damage to the cable. Cable with dents, flat spots, or other sheath distortions shall not be installed.

### **3.10 TERMINATION MODULES**

- A. Layout telephone and data terminal blocks as indicated on drawings with spacing as recommended by manufacturer.
- B. Ground all metal back frames with #6 insulated copper to the Chassis Ground System (CGS). Use Cool Amp bolted connections or Cadweld connections.

### **3.11 CROSS-CONNECTIONS**

- A. Cross-Connections at and/or between all terminal hardware shall be provided to form a complete and functioning system.
- B. Patch Cords shall be used to make all Cross-Connections.
- C. Cross-Connections from Terminal Modules color coded White to Terminal Modules color coded Blue shall be 4-pair wide and serve a single jack or termination in the horizontal distribution.

### **3.12 INTERCONNECTIONS**

- A. Interconnections at all terminal hardware shall be provided to form a complete and functioning system.
- B. Equipment cables shall be interconnected to horizontal cabling on Termination Modules color coded blue.

### **3.13 TERMINATIONS**

- A. Cables shall be marked with wire markers at both ends, and terminals on terminal blocks or patch panels shall bear the cable number. Trunk cables shall be neatly marked with "From-To" information.
- B. Wire twist shall be maintained to within 0.25 inch of the termination.

### **3.14 TERMINATION MODULES**

- A. Install per manufacturer's recommendations.

- B. Protection modules shall conform to NEC 800-30 and be installed per manufacturer's recommendations.

### **3.15 COMPLETION AND TESTING**

- A. Telecommunications System test reports shall be submitted to and approved by the Contracting Agency. The test reports shall certify that the Telecommunications Distribution System is complete, passes all test criteria, is fully operational, and that all work has been witnessed as specified.
- B. After installation and test of each system is complete, each system and the entire system shall be demonstrated and tested for proper operation. The Contractor shall schedule a demonstration with the following representatives present:
  - 1. Contractor's representative.
  - 2. Manufacturer's representative for each major communications subsystem.
  - 3. Contracting Agency's representative.
- C. The Contractor shall provide all forms, instrumentation and test equipment, loads, and other consumables required to demonstrate the systems to the Contracting Agency's satisfaction.
- D. Incoming Inspection Tests
  - 1. Inspect all materials for damage.
- E. Patch Cord Testing
  - 1. All patch cords shall be tested and shown to comply with the applicable Category cord requirements of TIA/EIA-568B.
  - 2. Compliance shall be proven by testing patch cords alone (i.e., not by inserting the patch cords into a channel).
  - 3. Cord performance shall be measured on-site by either using either the TIA method delineated in Annex J or by using a cord-test adapter and a hand-held LAN cable tester. Cord compliance may be demonstrated by actual test reports supplied by the patch cord manufacturer.
- F. Final Inspection Tests
  - 1. Testing of all copper wiring shall be performed prior to system acceptance. 100 percent of the horizontal and riser wiring pairs shall be tested. Link testing of all copper cabling shall be performed. Complete, end to end test results shall be submitted to the Contracting Agency.
    - a. Category 5e cable runs shall be tested for conformance to the specifications of EIA/TIA 568-B.2, Category 5e. Testing shall be done with a ANSI/TIA/EIA 568-B ETL verified Level II-E test set, with accuracy per Proposed TIA Level III standards.
      - 1). Test shall include all requirements of ANSI/TIA/EIA 568-B, including wiremap, length, characteristic impedance, insertion loss, ambient and impulse noise, NEXT, PSNEXT, FEXT, ELFEXT, PSELFEXT, return loss, ACR, PSACR, Propagation Delay and Delay Skew.

- 2). Supported test frequency shall be 1-100 MHz to provide re-certification capability beyond Category 5e requirements.
  - 3). "Full Plot" storage shall store entire test, and be capable of uploading saved data and re-characterizing cables against new or evolving performance standards. Testers only saving worst case data are not acceptable. Test data shall be saved and provided to the Owner in neatly bound hardcopy and electronic format compatible with ScopeData Pro® software. Provide a copy of the software with the data.
  - 4). Reports shall be graphic, showing test results plotted against standards. Reports shall include a pass/fail summary of all network types specified.
  - 5). Any cables not meeting the requirements of the standard shall be brought into compliance at no charge to the Owner.
  - 6). Tester shall be equal to Agilent Technologies (HP) WireScope 350, Fluke DSP-4000, or IDEAL LANTEK 6P.
2. Test all cable with an approved cable tester in the presence of the Contracting Agency, at the Contracting Agency's option. Provide three (3) working days advance notice of tests. Record cable numbers on data test reports. Submit reports to Contracting Agency.
  3. Test all cables from both ends.
  4. Re-test all cable disturbed after testing, at the direction of Contracting Agency.
  5. Spare unterminated cable shall be temporarily terminated for testing.
- G. Replace all rejected materials.
- H. Test AC grounds and voltages in equipment racks.
1. Record voltage at equipment rack power source both at no load and at 15 Amp resistive load.

### **3.16 OPERATING AND MAINTENANCE MANUALS**

- A. Prepare manuals describing the servicing and maintenance requirements for the equipment being provided as required in this Section of these specifications.
- B. Information contained in the manuals shall consist of catalog data on each item, together with parts lists, wiring diagrams, test reports, description of routine maintenance required, suggested frequency of maintenance and recommended practices, and shall be 8-1/2 inches by 11 inches in size. Catalog pages and data in manuals shall be neat, clean copies. Drawings shall be accordion folded to above size. An index shall be provided which shall list all contents in an orderly manner. Include corrected shop drawings in the maintenance manuals. Each copy of the instruction manual shall be adequately labeled for identification and shall include plastic tabs coordinated with the index.

- C. Provide "Step-by-step" instructions for interpreting and utilizing the cable, outlet, jack and equipment identification system, including instruction for use of jack icons.
- D. Refer to "Submittals" requirements of this Section for additional O&M requirements.

### **3.17 INSTRUCTION AND TRAINING**

- A. Provide detailed instructions to the Owner on how to obtain warranty service under the Special Warranty.

**END OF SECTION 16745**

## SECTION 16747

### TELECOMMUNICATIONS OPTICAL FIBER DISTRIBUTION

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION AND GENERAL SPECIFICATIONS

- A. The intent of this Specification is to place in working order a complete, fully tested and documented Optical Fiber Cable Distribution system complying with the Codes and Standards referenced herein.
- B. This section describes general requirements, products and methods of execution relating to provisions for service entry, equipment space and cabinets and optical fiber cabling and connections for the telephone and data systems required for this project.
- C. Provide the equipment, materials, and labor to install and test the systems shown on the Drawings and specified herein. This shall include (but not limited to) provision of all trenching and backfill, raceways, innerducts, sleeves, boxes, gutters, shelves, enclosures, shelf and enclosure supports, backboards, equipment racks, cables, patch cords, pull ropes (in unused conduits), Fiber Distribution Units (FDUs), panels, outlets, jacks, splices, connections, cable management, labeling, testing and all other material, equipment, and labor required to make the systems fully operational.
- D. References in this section to "fiber" shall refer to optical fiber cable.
- E. Scope of work:
  - 1. Fiber shall be provided between fiber optic patch panels as noted on the Drawings. All cables shall be fully terminated or fusion spliced and systematically identified on both ends.
  - 2. Provide conduit, innerducts, cable support systems, cable management, etc., for the routing of fiber cables as shown on the Drawings.
  - 3. Fusion splice factory pigtails on the existing, installed, unterminated singlemode fiber optic cable as noted on the Drawings.
  - 4. Perform testing of all fiber strands, including all spare and unused fibers, in accordance with the requirements herein.
  - 5. Provide fiber terminations and connectors in accordance with these specifications. The connector styles for this project are LC, SC and ST in the configurations noted.

##### 1.2 RELATED SECTIONS

16111	Conduit and Fittings
16745	Telecommunications Distribution System
16749	Local Area Network



### 1.3 COORDINATION

- A. The necessity to coordinate this work with the Department is emphasized. The Contractor shall be responsible for any omissions, delays and additional cost due to lack of coordination.
- B. The Contractor shall coordinate all work with other trades. Layout of cables to maintain minimum clearances shall be coordinated with all trades for new and existing work. Report all conflicts to the Department.
- C. Downtime for existing systems shall be minimized. It is the responsibility of the Contractor to plan, coordinate, and execute installation activities so that production networks and communication circuits are not unduly interrupted. Periods of unavoidable interruption must be less than 4 hours in duration.

### 1.4 REFERENCE CODES AND STANDARDS

- A. The publications listed below form a part of this section to the extent referenced. The edition current at the time of bid (with all applicable addenda) shall apply:

REFERENCE	TITLE/REVISION
ANSI/EIA/TIA- 455-B	STANDARD TEST PROCEDURES FOR FIBER OPTIC FIBERS, CABLES AND TRANSDUCERS, SENSORS, CONNECTING AND TERMINATING DEVICES AND OTHER FIBER OPTIC COMPONENTS
ANSI/TIA/EIA-526-7	MEASUREMENT OF OPTICAL POWER LOSS OF INSTALLED SINGLEMODE FIBER CABLE PLANT
ANSI/TIA/EIA-526-14A	OPTICAL POWER LOSS MEASUREMENTS OF INSTALLED MULTIMODE FIBER CABLE PLANT
ANSI/TIA-492AAAA-A	DETAIL SPEC. FOR 62.5/125 MULTI-MODE, GRADED INDEX OPTICAL FIBERS
ANSI/TIA-492AAAB	DETAIL SPEC. FOR 50/125 MULTI-MODE, GRADED INDEX OPTICAL FIBERS
ANSI/TIA-492CAAA	DETAIL SPEC. FOR CLASS 4A DISPERSION-UNSHIFTED SINGLEMODE OPTICAL FIBERS
ANSI/ICEA S-83-596	FIBER OPTIC PREMISES DISTRIBUTION CABLE
ANSI/ICEA S-87-640	FIBER OPTIC OUTSIDE PLANT COMMUNICATION CABLE
ANSI/ ICEA S-104-696	INDOOR-OUTDOOR OPTICAL FIBER CABLE
ANSI/TIA/EIA-568-B	COMMERCIAL BUILDING TELECOMMUNICATION CABLING STANDARD

ANSI/TIA/EIA-569-A	COMMERCIAL BUILDING STANDARD FOR TELECOMMUNICATIONS PATHWAYS AND SPACES
ANSI/TIA/EIA-598-A	OPTICAL FIBER CABLE COLOR CODING
ANSI/TIA/EIA-606-A	ADMINISTRATION STANDARD FOR COMMERCIAL TELECOMMUNICATIONS INFRASTRUCTURE
ANSI/TIA/EIA-607	COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS
ANSI/TIA/EIA-758	CUSTOMER-OWNED OUTSIDE PLANT TELECOMMUNICATIONS CABLING STANDARD
ANSI/TIA/EIA-758-1	ADDENDUM TO ANSI/TIA/EIA-758
ANSI Z136.2	AMERICAN STANDARD FOR THE SAFE OPERATION OF OPTICAL FIBER COMMUNICATION SYSTEMS UTILIZING LASER DIODE AND LED SOURCES
BICSI	TELECOMMUNICATIONS DISTRIBUTION METHODS MANUAL – 10 <sup>th</sup> EDITION

### 1.5 UL COMPLIANCE

- A. Where a UL listing or classification exists for a product and the product is suitable for the purpose specified and indicated the product shall:
  - 1. Bear the UL marking indicating listing or classification
- B. Where a UL Standard is in effect, equipment shall:
  - 1. Meet that Standard.
  - 2. Bear the UL Label.

### 1.6 QUALIFICATIONS

- A. The telecommunications work specified in this Section is acknowledged to require special skills mastered by education, experience, or both. Bidders for telecommunications work described in this Section shall be specialty telecommunications contractors, who may be a subcontractor of the Electrical contractor.
- B. Specialty Subcontractors bidding telecommunications work shall have a minimum of five (5) years experience in the construction, testing, and servicing of systems of the type and magnitude specified herein. This Subcontractor shall have completed at least three projects equal or larger in size than this project within the past five (5) years. The Subcontractor shall have direct access to all tools and test equipment required to complete the telecommunications work at the time of the bid. At least three comparable or larger experience projects and a list of the tools and test equipment (indicating ownership) expected to be used shall be submitted within 30 days of award to

demonstrate these experience and access requirements. Experience projects shall have been completed within the last five (5) years. For each project, include a brief description of the system types provided and the names of the personnel directly responsible for the design (if required, and to what extent), specification, ordering, installation, programming, testing, demonstration, and overall system coordination for each of the following system types:

1. Fiber Optic Cable Installation
  2. Fiber Optic Terminating and Splicing
  3. Fiber Optic Identification and Labeling
  4. Fiber Optic Testing
- C. For each of the experience projects submitted, provide the following information:
1. Name of the project
  2. Project location
  3. Date of completion
  4. Owner
  5. Owner's representative and phone number
  6. Description and dollar value of each installed system
  7. Name and specific responsibility of each Subcontractor or employee involved with the project
- D. Provide the names of the Contractor's personnel to be assigned to this project and the specific responsibility of each. If these names are not the same as the names included with the experience projects required above, submit additional experience projects to demonstrate the experience of those to be assigned to this project on other Telecommunications projects of similar size, magnitude and complexity. Fiber optic cable splices, terminations and testing shall be made by journeymen cable splicers who have had a minimum of 3 years of individual experience in splicing and terminating fiber optic cables. Each person who is to perform fiber optic cable splicing shall perform a minimum of one acceptable sample splice and termination. Sample splices and terminations shall not be incorporated in the job.
- E. The Telecommunications Subcontractor's project superintendent (in office) and foreman (field) shall have five years experience at the superintendent and foreman levels, respectively, on completed telecommunications projects of like magnitude and complexity.
- F. Demonstrate and document to the extent necessary that sufficient physical and personnel resources are available to accomplish the communications work of this project without endangering timely and proper completion of the work.
- G. Qualifications of Testing Personnel: Submit the qualifications of testing personnel to the Department for approval 30 days prior to testing. A complete instruction course outline including the contract requirements, specifications and Drawings plus the certification of the qualifications of the instructors shall

be submitted to the Department for approval no later than 30 days after the award of the bid.

- H. Test Record Format: Submit a Contractor-developed format for recording test data for approval by the Department as part of the test plan.
- I. Qualifications of Splicers: Submit the Qualifications of Splicers to the Department for approval and with adequate time to be approved 30 days prior to installation. A complete instruction course outline including the contract requirements, specifications and Drawings plus the certification of the Qualifications of the Instructors shall be submitted to the Department for approval no later than 30 days after the award of the bid. When the Contractor deems it necessary to deviate from the splices shown on the Drawings, the Contractor shall submit justification and the proposed splicing techniques to the Department for approval. Splices, if approved, shall be provided at no additional cost to the Owner.
- J. Provide a signed statement indicating that the telecommunications systems Subcontractor has the ability to provide the service required elsewhere herein by factory trained and qualified technicians for each major system type and will continue to maintain that capability until the end of the guarantee period.

## **1.7 SUBMITTALS**

- A. Submit the following in accordance with Specification Section 16010- "Submittals," and Division 1 in sufficient detail to show full compliance with the Specifications:
  - 1. Qualification Requirements as noted in this section.
  - 2. Manufacturer's Catalog Data shall be submitted for items as described in Section 2 of this Specification Section. Data shall include a complete list of parts, special tools, and supplies with current unit prices and source of supply.
  - 3. Factory Test Data: Submit factory test reports for all fiber optic cable shipped. All fiber strands shall be factory terminated and tested prior to shipping. Fiber shall be shipped with factory terminations intact for re-testing upon receipt in accordance with testing requirements herein.
  - 4. Manufacturer's Installation Procedures: Printed copies of the manufacturer's recommended installation procedures shall be submitted to the Department 30 days prior to installation, in accordance with the requirements herein.
  - 5. Shop Drawings: Submit Shop Drawings for approval by the Department as follows:
    - a. Dimensioned routing of conduits and innerducts for fiber optic cables as provided under Specification Section 16111 and indicated on the Drawings. Dimensioned layouts for existing conduit systems are not required.
    - b. Dimensioned rack plan layouts for all fiber optic termination equipment in all telecommunication rooms.

- c. Dimensioned rack elevation layouts for all fiber optic termination equipment in all telecommunication rooms.
- B. Labeling System: Coordinate with the Department for Owner's labeling conventions. Submit Project labeling system for approval.
- C. Quality Assurance Plan: Contractor shall prepare a quality assurance plan which provides a detailed outline of all testing to be accomplished. The quality assurance plan shall include, as a minimum, a schedule of when tests will be performed relative to installation milestones, specific test procedures that will be used, a list of test equipment that will be used including manufacturer, model number, calibration certification, range and resolution accuracy. Test plan shall be submitted to the Department for approval at least 30 days prior to the start of testing.

## **1.8 SPECIAL WARRANTY**

- A. The warranty shall extend from the date of substantial completion to the longer of fifteen (15) years or the length of the standard warranty offered by the successful manufacturer.
- B. The warranty shall be extended to the Owner via the manufacturer through a single point of contact and shall be fully backed by the manufacturer.
- C. The Extended Product Warranty and System Assurance Warranty for this wiring system shall be provided consisting of the following:
  - 1. The Extended Product Warranty shall ensure against product defects, that all approved cabling components exceed the specifications of ANSI/TIA/EIA 568-B and ISO/IEC IS 11801-B, exceed the attenuation requirements of ISO/IEC IS 11801-B for cabling links/channels, and that the installation will exceed the loss and bandwidth requirements of ISO/IEC IS 11801-B for links/channels. The warranty shall apply to all passive Telecommunication Distribution System (TDS) components.
  - 2. The System Assurance shall cover the failure of the wiring system to support any existing application, as well as additional application(s) introduced in the future by recognized standards or user forums that use the ANSI/TIA/EIA 568-B or ISO/IEC IS 11801-B component and link/channel specifications for cabling.
    - a. FDDI
    - b. IEEE 802.3z 1000Base-SX, 1000Base-LX
    - c. IEEE 802.3 10GBASE-X For 10Gb/s.
    - d. Guaranteed extended distance operation of IEEE 802.3z 1000Base-SX, 1000Base-LX over fiber optimized for 10GBASE-X
    - e. Future application certified under the applicable standards as noted above.

3. The Extended Product Warranty and the System Assurance shall cover the replacement or repair of defective product(s) and labor for the replacement or repair of such defective product(s).
  - a. In the event this specialty subcontractor is unable to perform, fails to provide satisfactory support, goes out of business, or ceases to exist the manufacturer shall be responsible for taking all necessary remedial steps including identifying a new contractor to provide the warranty work.
  - b. Manufacturers shall bear full responsibility for the work of their certified installer, including all aspects of the design and installation.
4. Upon successful completion of the installation and subsequent inspection, the customer shall be provided with a numbered certificate, from the manufacturing company, registering the installation.
- D. Submit a summary of the warranty, highlighting all major features. Clearly disclose all exceptions to the requirements of this document, and specifically indicate any and all provisions which could potentially void the warranty or reduce its benefit to the Owner.
- E. Warranty programs approved as meeting the specified warranty are listed below. Final approval is subject to review and approval of the warranty.
  1. Corning Extended Warranty Program
- F. Provide summary of warranty highlighting major features. Clearly disclose all exceptions to the requirements of this document, and specifically indicate any and all provisions which could potentially void the warranty or reduce its benefit to the Owner.

## **1.9 REGULATORY REQUIREMENTS**

- A. All Work shall conform to the requirements of NFPA 70.
- B. All Work shall conform to all requirements of Federal, State and Local Electrical and Telecommunications Regulations.

## **1.10 MANUFACTURERS' RECOMMENDATIONS**

- A. All installation procedures shall be in accordance with the recommendations of the manufacturer of the material being installed. Printed copies of these recommendations shall be submitted to the Department 30 days prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received and approved by the Department. A copy of the recommendations shall be kept at the job site.

## **1.11 TERMINOLOGY**

- A. References in this section to "fiber" shall refer to optical fiber cable.
- B. "Composite" – Copper conductors and fibers within a single jacket.
- C. "Hybrid" – Singlemode and multimode fibers within a single cable jacket.
- D. "ACS" shall refer to the Access Control System as specified elsewhere in these Specifications.

- E. "DBC" shall refer to an Access Control System DataBase Controller as specified elsewhere in these Specifications and as indicated on the Drawings.
- F. "TDS" shall refer to the Telecommunication Distribution System cabling and hardware infrastructure internal and external to a building or buildings used to transmit voice, data, etc.
- G. "Stations" shall refer to individual telephone or computers, or remote peripherals of those systems (e.g.: printers, facsimile machines, modems, etc.).
- H. "Outlets" shall refer to the group of receptacles or jacks at the location where the stations connect.
- I. "Jacks" or "Ports" shall refer to the individual receptacles where phones, computers, etc. connect.
- J. "Station Cables" shall refer to the horizontal cables connecting patch panels or terminal blocks in the Telecommunications Rooms to the stations.
- K. "Pathways" shall refer to conduits, sleeves, cable trays, distribution rings, etc., which are employed to route backbone and stations cables between equipment rooms, telecommunications rooms, stations, outlets, etc.
- L. "Backbone Cables", "Riser Cables" or "Tie Cables" shall refer to optical fiber cables 6-strand or more, connecting main cross-connect facilities, intermediate cross-connect facilities and telecommunications rooms. These cables may include outside plant cables between buildings and riser cables between floors.
- M. "Equipment Rooms" (ER) or "Communication Equipment Rooms" (CER) shall refer to a special-purpose room that provides space and maintains a suitable operating environment for large communications and/or computer equipment. These rooms may contain main cross-connect or intermediate cross-connect facilities, MUXs, PBXs and building entrance facilities from the local exchange carrier (LEC). Main rooms may also be referred to as a MDF.
- N. "Telecommunications Room (TR)" shall refer to a floor-serving facility for housing telecommunications equipment, cable terminations and cross-connect wiring. This shall be the point at which station cables terminate. It may also be referred to as an IDF.
- O. "Patch Panels" shall refer to rack or frame mounted multiple cable terminations with the type of connectors as specified herein.
- P. "Cable Management" shall refer to rings, troughs, gutters etc., mounted in conjunction with telecommunications distribution equipment and terminal blocks, for the orderly routing of cables, patch cords, etc.

## **1.12 STORAGE AND HANDLING**

- A. Care shall be exercised in handling materials during construction. Damage shall be repaired or replaced as directed by the Department.
- B. Test all fiber upon receipt and store properly until installed. Immediately replace all fibers that are damaged upon receipt.

- C. Immediately report any visible damage to shipped products to the shipper, the manufacturer, and the Department.

## **PART 2 - PRODUCTS**

### **2.1 GENERAL**

- A. All materials shall be as specified, first quality, manufacturer's current production.
- B. The Basis of Design for optical fiber cabling, connecting hardware, and related hardware in this section is Corning Cable Systems as a standard for quality and performance. Listed manufacturers meeting all the system quality, performance and warranty requirements of this specification are also acceptable. The burden of proof is on the Contractor to demonstrate that all performance and warranty requirements are met. Any listed manufacturers products submitted without information giving detailed item by item comparison with the Basis of Design will be rejected without review. All manufacturers other than those listed in this section will be rejected without review. There are no approved alternate fiber cabling and connecting hardware product manufacturers for this Project.

### **2.2 FIBER OPTIC CABLE CONNECTORS**

- A. Interior cable: Provide field installable multimode (MM) or singlemode (SM) connectors to terminate fiber optic cables from cable-to-cable, cable-to-equipment or equipment-to-equipment, and to make jumpers.
- B. Exterior cable: Provide epoxy and polish type connectors for all outdoor multimode fiber optic cable terminations. Provide factory terminated pig-tailed connectors for all outdoor singlemode fiber optic cable terminations.
- C. The connector shall be capable of mounting on either 0.9 mm buffered fiber or on 3.0 mm cordage and utilize a PC polishing on the tip to provide high yield during installation. All connectors shall have ceramic ferrules, meet EIA and IEC standards for repeatability and have a locking feature to the coupler and assure non-optical disconnect.
- D. This project shall use type duplex SC or duplex LC connectors for singlemode cabling and type ST connectors for multimode cabling unless otherwise noted. These connectors shall meet the following criteria:
  - 1. LC, SC, and ST Connector Specifications
    - a. Typical Insertion Loss: 0.10 dB
    - b. Return Loss: better than -26 dB MM, -55 dB SM
    - c. Temp. Stability: -40°C to 75°C
- E. Adapter panels
  - 1. Provide type as indicated herein in pre-pigtailed configuration, where commercially available



## **2.3 FIBER PATCH PANEL AND SPLICE CABINETS (RACK MOUNTED)**

- A. Provide low density termination and administration point for the fiber cables in the telecommunications rooms with 24 or fewer fiber terminations meeting the following requirements:
1. Stackable and able to fit within either 19-inch or 23-inch rack frames with six adapter panel positions per two unit (3.5 inch) frame.
  2. Hinged translucent door on the front side of the connector panels
  3. Factory installed lock kit for hinged front panel furnished with two keys for each front panel. All enclosures for this project shall be keyed alike.
  4. Room and provisions to provide fiber identification
  5. Pre-punched and pre-loaded adapter panels with fiber adaptors of the types specified herein, recessed a minimum of 2.5 inches from the front of the shelf for patch cable management. Provide full compliment of fiber adapters and adapter panels for each frame. Label unused adapters "SPARE."
  6. Fully front and rear accessible. The unit shall slide out to allow top access.
  7. Protection features for the connectorized fiber to prevent mechanical stress, macro-bending losses at the connection point, and tampering with the circuits.
  8. Protection for fiber patching or splicing
  9. Jumper routing bend limiters

## **2.4 ENVIRONMENTAL DISTRIBUTION CENTER**

- A. Provide a NEMA 4X, outdoor rated, fiber optic cable distribution center for the protection of connections and splices (splices where specifically allowed by these Specifications).
1. Corning Cable Systems EDC-02P-NH. Provide adapter panels to terminate all fiber strands provided under this Contract at each location.

## **2.5 PATCH CORDS AND JUMPERS**

- A. Provide patch cords from same manufacturer as that providing fiber optic cabling. These fibers shall be constructed from glass of the same grade as that used to construct the backbone and horizontal cables.
- B. Multimode Patch Cord Specifications:
1. The fiber patch cord shall consist of buffered, graded index fiber with a 50 micron core and a 125 micron cladding. The fiber coating shall be covered by Aramid yarn and a flame retardant jacket.
  2. Provide two-strand riser rated zipcord style cords for all duplex patch through and equipment connection applications. Provide single strand cords for single equipment connections.
  3. Provide patch cords factory terminated with connectors in the type specified herein in the quantity and length(s) required to make an orderly, manageable connection between all patch panels and equipment being cross-connected.

4. Multimode patch cords used for the Access Control system connections to the existing fiber optic cable plant and to Access Control System related shall be custom colored "violet" or "purple" to differentiate the patch cords from other networks types.
  5. Provide hybrid patch cords consisting of a duplex LC connector or duplex SC connector on one end and a ST connectors on the other end as connected equipment and patch panels necessitate.
  6. Mated Connector Loss: 0.3 dB typical, guaranteed maximum 0.5 dB
  7. Return Loss: better than -20 dB
  8. Cable Retention: 20 lb. minimum, <0.2 dB change
- C. Singlemode Patch Cord Specifications:
1. The fiber patch cord shall consist of buffered, step-index fiber with an 8.3 micron core (typical) and a 125 micron cladding. The fiber coating shall be covered by Aramid yarn and a flame retardant jacket.
  2. Provide two-strand riser rated zipcord style cords for all duplex patch through and equipment connection applications. Provide single strand cords for single equipment connections.
  3. Provide patch cords factory terminated with connectors in the type specified herein in the quantity and length(s) required to make an orderly, manageable connection between all patch panels and equipment being cross-connected.
  4. Singlemode patch cords used for the Access Control System connections to the existing fiber optic cable plant and to Access Control System related equipment shall be custom colored "violet" or "purple" to differentiate the patch cords from other networks types.
  5. Provide hybrid patch cords consisting of a duplex LC connector on one end and a duplex SC connector on the other end as connected equipment and patch panels necessitate.
  6. Mated Connector Loss 0.3 dB typical, guaranteed maximum 0.5 dB
  7. Return Loss: better than -55 dB
  8. Cable Retention: 20 lb. minimum, <0.2 dB change

## **2.6 FIBER OPTIC FLEXIBLE DUCT**

- A. Provide conduit innerducts for use with fiber optic cabling in accordance with Section 16111.

## **2.7 MULTIMODE FIBER OPTIC CABLE— 50/125**

- A. Multimode fiber cable shall be 50  $\mu$ m dual window graded index optical glass with nominal 125  $\mu$ m cladding diameter. The optical fiber shall comply with ANSI/TIA/EIA-492AAAB. Multimode fiber for indoor locations shall be of the tight buffered design.
- B. Multimode fiber shall meet the following specifications:
1. Maximum Attenuation: 3.5/1.5 dB/km @ 850/1300 nm
  2. Minimum Overfilled Bandwidth: 1500/500 MHz @ 850/1300 nm
  3. Maximum Distance for Running 1 GbE: 1000/550 m @ 850/1300 nm

4. Maximum Distance for Running 10 GbE: 300/300 m @ 850/1300 nm

- C. All fibers shall be color coded to facilitate individual fiber identification. Fibers shall have protective coating to ensure color retention, minimize micro-bending losses and improve handling. The coating shall be mechanically strippable.

## **2.8 SINGLEMODE FIBER OPTIC CABLE**

- A. Singlemode(SM) fiber cable shall be 8.3  $\mu$ m (typical) step-index optical glass with nominal 125  $\mu$ m core/cladding diameter. The optical fiber shall comply with ANSI/TIA/EIA-492CAAA. Singlemode fiber for outdoor locations shall be of the loose tube design.
- B. 10 GbE singlemode fiber shall meet the following specifications:
1. Maximum Attenuation: 0.5/0.4 dB/km 1310 @ nm
  2. Maximum Distance for Running 10 GbE:  $\geq$ 10,000 m @ 1310 nm
- C. All fibers shall be color coded to facilitate individual fiber identification. Fibers shall have protective coating to ensure color retention, minimize micro-bending losses and improve handling. The coating shall be mechanically strippable.

## **2.9 HYBRID FIBER OPTIC CABLES**

- A. Where required by the drawings provide combination multimode and singlemode fiber optic cable under the same outdoor rated cable jacket. Optical characteristics of the hybrid cable shall match the multimode requirements and singlemode requirements as specified above.

## **2.10 FIBER SPLICES**

- A. Fiber optic splices are not allowed except where specifically noted on the Drawings or where pre-terminated pigtails are used for fiber terminations. If field conditions are discovered that require additional splices, submit a request in writing to the Department and obtain approval prior to performing splice.
- B. The fiber splice module shall meet the following specifications:
1. All splices shall be mounted in trays contained in splice closures.
  2. Fusion Splices: Fiber optic splices shall be fusion splices performed in the field by a qualified splicer (Refer to Qualifications paragraph in Part 1 of this specification). Mechanical splices are not allowed.
    - a. Fusion splice specifications (at 1300 nm or 1550 nm,  $\pm$  5nm):
    - b. Typ Splice loss: less than 0.02 dB MM OR less than 0.05 dB SM
    - c. Integral heat shrink splice protection feature
    - d. Equipment: Corning M90, or as approved.

## **2.11 LABELING**

- A. Provide machine printed labels for all patch panels, cables, etc., in accordance with ANSI/TIA/EIA-606-A. Provide labeling nomenclature in accordance with information on the drawings or Owner's labeling conventions. Submit labeling samples for all required applications.

**B. Machine Printed Label Requirements:**

1. PC Compatible
2. Can save and modify files
3. Fully integrated with AutoCAD
4. Editable Fonts and Sizes
5. Rotate Text and Objects
6. Vary Line Spacing
7. Ability to import graphical images
8. Capable for customization of layout
9. Re-positional labels

**C. Basis of Design:**

1. Brady Electrical/Datacomm Worldwide (latest version of LabelMark)
2. Cable Management Software International (latest version of docIT)
3. Approved alternate

**D. Enter all telecommunications circuit data into the Owner's existing cable management database.**

**E. Labeling and color coding identification for this project shall conform to TIA/EIA-606-A for a Class 4 Administrative System.**

**2.12 UNSPECIFIED EQUIPMENT AND MATERIAL**

- A. Any item of equipment or material not specifically addressed on the Drawings or in this document and required to provide a complete and functional FODS installation shall be provided in a level of quality consistent with other specified items.

**PART 3 - EXECUTION**

**3.1 FACTORY TESTING PROGRAM**

- A. Terminate and test all fiber optic cables on the spools at the factory prior to shipping. Submit factory test reports in accordance with submittal requirements.
- B. Ship fiber spools with factory test terminations in place for re-testing by the Contractor upon receipt.
- C. Receipt Testing
1. Verify in factory test reports that all fiber cables met all specified testing parameters prior to shipping. Perform receipt testing of fiber on the site or at the Contractor's storage facility. Fibers which do not pass receipt testing may be field terminated and re-tested by the Contractor. All fibers shall pass receipt testing or shall be replaced at no cost to the Owner.
  2. Proceeding with fiber installation will be construed as the Contractor's acceptance of materials.

**3.2 CABLE INSTALLATION FOR ALL CABLES**

- A. Contractor shall OTDR test each fiber on each reel of received fiber optic cable and report results to Owners Representative prior to installation.

- B. Follow cable manufacturer's specifications regarding handling methods, bend radius and maximum pulling tension limitations.
- C. Install copper cable(s) in the same pathway as optical fiber cable(s) only when the copper cable(s) and the fiber optic cable(s) are installed in separate innerducts. Maintain separation of cable types as much as practicable.

### **3.3 UNDERGROUND CABLE INSTALLATION**

- A. All underground optical fiber cable shall be run in existing inner ducts as noted on the Drawings. Refer to Specification Section 16111 for additional information on inner ducts.
- B. Inner duct shall enclose all optical fiber cable in conduit and ladder rack. Inner duct shall be securely fastened to ladder rack and shall end directly above the rack in which the fiber is terminated.
- C. Inner duct assignment of individual cables shall be as indicated. Cables shall not be placed in ducts other than those specified.
- D. Fiber optic cables transitioning through handholes and manholes shall be enclosed in inner duct and positioned to avoid damage by personnel or equipment.

### **3.4 FIBER SPLICES**

- A. All fiber colors shall be continuous from end to end. No switching or staggering of color scheme within the cable at splice points shall be allowed. Fibers shall be spliced in order.

### **3.5 BENDING**

- A. Caution shall be used when bending cable to avoid kinks or other damage to the sheath. Bend radius shall be as large as possible with a minimum of 20 times cable diameter. Minimum radius shall be increased when necessary to meet cable manufacturer's recommendation. Cables shall not rest against any sharp edges.

### **3.6 CABLE PULLING LUBRICANT**

- A. Pulling lubricant, shall be used to minimize pulling tension and prevent sheath damage when pulling cables into ducts and conduits. Lubricant shall be applied to the cable sheath with a lubricator. When pulling has been completed, the exposed cable ends shall be wiped clean of lubricant.
- B. Lubricants shall be compatible with and intended for use with plastic-sheathed cables. Soap and grease type lubricants are not allowed.

### **3.7 CABLE PULLING**

- A. Pulling lines shall be attached to both cable ends when cable is destined for bi-directional pull, and fitted with factory-installed pulling eyes where possible. Cables not equipped with a pulling eye shall have the pulling line attached to the cable end by means of a cable grip. Core hitches shall not be used.

- B. Cable reels shall be located and aligned so that the cable is payed out from the top of the reel by rotating the reel in the feed direction at the rate of pull into the duct or conduit in a long, smooth bend without twisting. Cable shall not be payed out from the bottom of the reel or by pulling. A cable feeder guide of proper dimensions shall be used at the mouth to guide the cable into the duct or conduit.
- C. Rigging shall be set up at the pulling end so that the pulling line and cable exit on a line parallel with the duct or conduit to prevent either from rubbing against the edge or mouth. Cable ends shall not be pulled around sheave wheels. When the sheave or pulley cannot be positioned to obtain sufficient cable end slack for proper racking and splicing with the pulling line attached to the end of the cable, a split cable grip may be used to obtain the necessary slack.
- D. All equipment and the pulling set shall be checked to minimize interruptions once pulling begins. Cable shall be payed out without stopping until the required amount of the cable has been placed. If the pulling operation is halted before the pull is completed, the tension of the pulling line shall not be released. When pulling is resumed, the inertia of the cable shall be overcome by increasing the tension in small steps a few seconds apart until the cable is in motion.
- E. Pulling tension shall not exceed 500 lbs or cable manufacturer's recommendation, whichever is less.

### **3.8 DAMAGE AND DEFECTS**

- A. Contractor shall use a tension monitoring device to ensure that the maximum pulling tension that may be applied to the cable to be pulled into a conduit section is not exceeded. Contractor shall replace cable if cable manufacturer's maximum pulling tension is exceeded at any time during a pull.
- B. Cable shall be carefully inspected for sheath defects or other irregularities as it is payed out from the reel. When defects are detected, pulling shall stop immediately and the cable section shall be repaired or replaced at the discretion of the Owner. A system of communications shall be maintained between pulling and feed locations so that pulling can be stopped instantly, when required.
- C. Cable shall be hand guided through intermediate pull points and into the next duct section when making pull-throughs. Proper rigging shall be used in the intermediate pull points to keep the pulling line and cable aligned with the exit duct to prevent the line or cable from rubbing against the edge of the duct. Cables in intermediate pull points shall be set up and/or racked before the cable ends in adjacent manholes are set up and/or racked.
- D. Cable ends pulled into manholes, vaults, pull boxes, or terminal locations that are not to be racked or otherwise permanently positioned immediately shall be tied in fixed positions to prevent damage to the cables and provide adequate working space.

- E. Adequate care shall be exercised when handling and storing reels of cable to prevent damage to the cable. Cable with dents, flat spots, or other sheath distortions shall not be installed.

### **3.9 SECURING CABLE**

- A. Immediately after cable placement, a permanent identification tag as indicated shall be attached to visible cable sections. Cables shall be checked to ensure that the markings are intact.
- B. Cables and equipment shall be supported and secured as indicated. Where the specific method of support is not shown, supports and fasteners shall be used to secure cables and equipment in position. All cables shall be routed along the interior sides of manholes. Maintain manufacturer's specified minimum bend radius. Cables shall not be kinked during installation.

### **3.10 SEAL**

- A. Ducts or inner ducts located in damp, wet, or exterior locations shall be sealed with urethane foam duct seal. This material shall be inserted between the cable and the duct or inner ducts of which it is in, between the inner ducts and the duct, and in all unused inner ducts, in order to prevent damage to the cable sheath and to prevent the entrance of dirt or water into the manhole or vault.

### **3.11 OPTICAL FIBER DISTRIBUTION UNITS**

- A. All cable terminations shall be made in optical fiber distribution units or rack mounted optical fiber patch panels. All installed fibers shall be terminated.
- B. Optical fiber cables are to be enclosed in flexible duct over their entire length into the fiber distribution unit chassis (FOT Cabinet) or equipment rack.

### **3.12 ENVIRONMENTAL DISTRIBUTION CENTER**

- A. Mount environmental distribution centers in existing gate cabinets/enclosures as noted on the drawings. Where required due to size constraints, provide a separate NEMA 4X enclosure adjacent to the existing cabinets/enclosures to house the environmental distribution center and provide a 100W Hoffman enclosure heater inside the separate NEMA 4X enclosure. Connect heater to local 120V power circuit.
- B. Provide a 1-1/2 conduit from the environmental distribution center or enclosure housing the environmental distribution center to the ACS Edge switch enclosure for routing of fiber optic cable patch cords.

### **3.13 TESTING**

- A. Perform in-place testing of all installed, terminated fibers in accordance with TIA/EIA OFSTP-7 and OFSTP-14 methods. Document and submit all test results in accordance with the Specifications.

B. Multimode Testing:

1. Perform optical power loss measurements in accordance with TIA/EIA Standard OFSTP-14 using method C. In addition, perform OTDR testing on multimode fiber in accordance with tester manufacturers procedures and examine traces for events indicating faults or flaws which may affect network performance.
  - a. Method C: Using an Optical Loss Test Set (OLTS) with hard-copy and disk/CD output capability to test each installed multimode permanent link fiber from both directions at 850 and 1300 nm.
  - b. Using an Optical Time Division Reflectometer (OTDR) test each installed fiber from both directions at 850 and 1300 nm for multimode fiber permanent link, minus patch cords.
  - c. Calculate and document test results in accordance with TIA/EIA Standard OFSTP-14.

C. Singlemode Testing:

1. Perform optical power loss measurements in accordance with TIA/EIA Standard OFSTP-7 using both methods A.3 and B.
  - a. Method A.3: Using an Optical Loss Test Set (OLTS) with hard-copy and disk/CD output capability to test each installed singlemode permanent link fiber from both directions at 1310 and 1550 nm.
  - b. Method B: Using an Optical Time Division Reflectometer (OTDR) test each installed fiber singlemode permanent link fiber from both directions at 1310 and 1550 nm.

D. Output a graph which indicates the attenuation and distance of each optical fiber for each test performed. The OTDR and associated software shall be Fluke DTX-1800 with appropriate adapters to test singlemode and multimode fiber optic cable and the appropriate software to provide reports or approved equal. Note on each page of test output:

1. Date and Time
2. Test Location
3. Test Technician's Name
4. Test Equipment Used
5. Cable number
6. Strand number
7. Strand Color
8. Direction of Test
9. Wavelength
10. Attenuation
11. Length

E. Test jumpers shall be of the same fiber core size and connector type as the cable system.

F. The power meter and the light source shall be set to the same wavelength.



- G. The light sources, OTDR or OLTS shall operate within the ranges of operation specified for 850 nm, 1300 nm, 1310 nm and 1550 nm in accordance with TIA/EIA-526-14 and TIA/EIA-526-7, or the manufacturer's recommendation whichever is the more stringent. Power meters shall be calibrated and traceable to the National Bureau of Standards.
- H. All system connectors, sleeves and jumpers shall be properly cleaned before measurements are taken.
- I. All testing shall be certified as passing testing standards established by TIA/EIA specification for fiber optic cable.
- J. Test Reports
  - 1. Contractor shall submit optical fiber test results for each fiber installed. Optical Time Domain Reflectometer (OTDR) Optical Loss Test Set (OLTS) output test result graphs shall be provided for each fiber installed on 8.5 inches by 11 inches pages. Also provide output data on CD or DVD. The OTDR files shall be for use with the OTDR analysis package software. A copy of the OTDR analysis package software, licensed to the Owner, shall be delivered to the Owner upon completion of the project.

**END OF SECTION 16747**

## **SECTION 16749**

### **LOCAL AREA NETWORK (LAN)**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

**A. Section includes:**

1. General description, functional requirements, characteristics, and criteria for the expansion of the Ted Stevens Anchorage International Airport (ANC) Information Technology (IT) Ethernet Local Area Network (LAN) to support the installation of a new Transmission Control Protocol/Internet Protocol (TCP/IP) based Access Control System (ACS). Work includes the convergence of ANC's existing Closed-Circuit Television (CCTV), and Digital Video Recording (DVR) security subsystems onto the expanded LAN.

**B. Related Sections:**

1. Section 01300 – Submittals
2. Section 01340 – Shop Drawings, Product Data and Samples
3. Section 01600 – Material and Equipment
4. Section 13710 – Access Control System
5. Section 13720 – ACS Sequencing and Cutover
6. Section 13730 – ACS Performance Verification Testing
7. Section 16745 – Telecommunications Distribution System
8. Section 16747 – Telecommunications Optical Fiber Distribution
9. Section 16995 – Electrical Commissioning
10. Section 16997 – Electrical Functional Testing Requirements
11. Section 16998 – Electrical Prefunctional Installation Examination Requirements
12. Division 16 - Electrical: All sections of Division 16 shall apply to installation of the LAN.

##### **1.2 GENERAL**

- A. Provide all labor, products and services required for the installation, programming, checkout, and testing of a physically complete and fully functional LAN as detailed herein and on the Contract Drawings.
- B. Where the work of several trades is involved, coordinate all related work to provide each system complete and in proper operating order.
- C. Cooperate with all others involved in the Project, with due regard to their work, to promote rapid completion of the entire Project.

- D. Local conditions: The Contractor shall thoroughly familiarize itself with the work as well as the local conditions under which the work is to be performed.
- E. Schedule work with regard to seasons, weather, climatic conditions, and all other local conditions, which may affect the progress and quality of the work.
- F. The system shall consist of the following major components:
  - 1. Core/Distribution Ethernet Switch
  - 2. Interior Ethernet Switch
  - 3. Environmentally Hardened Ethernet Switch
  - 4. Domain Controller

### **1.3 REFERENCES**

- A. Institute of Electrical and Electronic Engineers (IEEE)
  - 1. IEEE C2 (1999): National Electrical Safety Code
  - 2. IEEE 802.1D: Media Access Control (MAC) Bridges
  - 3. IEEE 802.3: Information Technology - Local and Metropolitan Area Networks - Part 3; Carrier Sense with Collision Detection (CSMA/CD) Access Methods and Physical Layer Specification
  - 4. IEEE 802.3u: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method & Physical Layer Specifications: Mac Parameters, Physical Layer, Medium Attachment Units and Repeater for 100 Mb/s Operation (Version 5.0)
  - 5. IEEE 802.3x: Supplement to Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method & Physical Layer Specifications: Specification for 802.3 Full Duplex Operation
  - 6. IEEE 802.3z: Gigabit Ethernet Standard
- B. National Fire Protection Association (NFPA)
  - 1. NFPA 70 (1999): National Electrical Code (NEC)

### **1.4 CONFLICTS**

- A. Where a conflict exists between referenced requirements, comply with the more stringent requirement.
- B. Where a conflict exists between drawings and specifications, comply with the more stringent requirement.
- C. Where a conflict exists in equipment quantities, the Contractor shall provide the greater quantity.

### **1.5 SUBMITTALS**

- A. Provide submittals for all products in this section in accordance with the requirements of Section 16010 - Electrical General Provisions and Division 1.

- B. Unless specified otherwise in specific sections the submittal requirements shall be applicable to all equipment contained in this section. Gather Section 16749 data together and organize and present as one unified submittal in accordance with Sections 01300 - Submittals and 01340 – Shop Drawings, Product Data and Samples.
- C. Provide full documentation for the configuration of each switch and route processor in both hard copy and soft copy format. Both hard and soft copy shall be fully annotated indicating what actions each part of the configuration performs. Soft copy shall be suitable for pasting into the switch or route processor via the console port or telnet.
- D. Product Data Submittals:
  - 1. Submit catalog cut sheets, technical data sheets, manufacturer specifications and/or diagrams necessary to illustrate a product, material or system for some portion of the work. Product data literature is required on all items of material and equipment and should be clearly marked; identifying specific items proposed with a reference to the specification requirement the item is being submitted for.
  - 2. Product data shall include adequate descriptive literature and catalog cut sheets required for the Department to ascertain that the proposed equipment and materials comply with specification requirements.
- E. Drawings:
  - 1. LAN Diagram
    - a. Submit a complete annotated copy of the block diagram for this network indicating IP addresses and names for all devices. Diagrams shall include all port assignments for both LAN uplinks and access control edge devices.
    - b. System block diagrams.
    - c. System riser diagrams.
    - d. Fiber Optic and Copper Patch Panel port connection diagrams.
    - e. Prepare using the latest release of AutoCAD and deliver files to the Department.
- F. Record Shop Drawings: Provide a copy of corrected, approved shop drawings for the project, updated to show as-built condition. Include the manufacturers' brochures in the "as-built" documentation. Plans shall indicate exact device locations, panel terminations, cable routes and wire numbers as tagged and color-coded on the cable tag. Prepare "as-builts" using the latest release of AutoCAD and deliver files to the Department.
- G. Warranty information: All materials relating to warranties.
- H. Manufacturer's training certifications of service personnel.

**I. Manuals:**

1. Provide complete sets of manuals and other information necessary for the operation and maintenance of the system in accordance with Division 1 requirements.
2. **Manuals:** Manuals shall include names, addresses, and telephone numbers of each subcontractor installing equipment and systems, and nearest service representatives for each item of equipment for each system.
  - a. The manuals shall have a table of contents and tab sheets.
    - 1). Tab sheets shall be placed at the beginning of each chapter or section and at the beginning of each appendix.
    - 2). The final copies delivered after completion testing shall include all modifications made during installation, checkout, and testing.
3. **Design Manual:** Design manual shall identify the operational requirements for the system and explain the theory of operation, design philosophy, and specific functions. A description of hardware and software functions, interfaces, and requirements shall be included for all system operating modes.
4. **Maintenance and Service:** The maintenance manual shall describe maintenance for all equipment including inspection, periodic preventive maintenance, fault diagnosis, and repair or replacement of defective components. Manufacturer's repair manuals shall include the ACS equipment physical layout and schematics to the component level.
5. **Operation and Maintenance** manuals shall be fully corrected to include review comments prior to final submission to the Department.

**1.6 TRAINING**

- A. Provide training to ANC IT staff on installation and configuration of environmentally hardened switches. At the Department's option, training shall be performed by allowing ANC IT staff to configure one or more of the production network switches.
- B. Provide 16 hours of training to ANC Maintenance staff on the overall system architecture, physical equipment locations, fiber optic and copper LAN connections, etc. to allow for high level troubleshooting of the LAN infrastructure and components.
- C. Training on the Cisco product shall be limited to demonstration of how to configure any new protocols or features that are not present in the existing portion of the network.

## 1.7 QUALITY ASSURANCE

- A. The equipment manufacturers shall have been in business manufacturing similar products for at least 10 years.
- B. Bidder qualification: Equipment shall be installed by qualified individuals having at least five (5) years experience installing and maintaining similar equipment. The qualified individuals shall have installed at least two (2) systems of similar type and size within the past five (5) years. Submit evidence of successful installation, Owner training and maintenance for a minimum of the previous five years. Provide listing of projects with verifiable references with names and telephone numbers. Provisions of this paragraph will be verified by the Department prior to issuance of a letter of award to the apparent low bidder. A failure to provide this information or to comply with these qualifications will result in non-award. The Department retains the right to award the Contract to the next lowest, qualified bidder.
- C. System configuration and programming shall be performed by an ANC designated Value Added Reseller (VAR). The VAR personnel working on the project shall be Cisco certified (Cisco certified CCIE in routing and switching at a minimum) for installation, programming, and test and checkout of the LAN. Refer to the Division 1 Bid Form for additional information regarding the VAR.

## 1.8 WARRANTY AND SERVICE

- A. Warranty shall commence in accordance with the final completion date and shall not be a function of material delivery dates.
- B. Warrant all components, parts and assemblies against defects in materials and workmanship for a period of 12 months from **final** completion. Warranty service shall be provided by a trained specialist of the equipment manufacturer.
- C. Warranty response time shall not exceed **four (4) hours**.
- D. Provide one-year Cisco Smartnet 24x7x4 support for all core and distribution switch components.
- E. Provide one-year 8x5xNext Business Day Smartnet coverage for 3750 switches.
- F. Provide manufacturer's standard one-year warranty on all environmentally hardened industrial switches.

## 1.9 EXISTING LAN CONFIGURATION

- A. The existing LAN at ANC consists of one Cisco 6509 core distribution switch in each Main Telecom Room of the North and South Terminals (two total). These switches are interconnected using two (2) 1000Base-LX links in a channel group configuration. Each of the two existing core / distribution switches supports a combination of 1000Base-LX and 100Base-FX uplinks from stackable switches

located throughout the respective terminals and at various remote locations on site. All existing uplinks are single ended homing only to one core / distribution switch. Basic configuration of the existing switches is as follows:

B. North Terminal (Denali) Existing 6509 Configuration:

Mod	Ports	Card Type	Model	Serial No.
1	48	CEF720 48 port 10/100/1000Mb Ethernet	WS-X6748-GE-TX	SAD0749060L
2	8	Network Analysis Module	WS-SVC-NAM-2	SAD0720046H
3	8	Firewall Blade	WS-SVC-FWM-1-K9	
5	2	Supervisor Engine 720 (Active)	WS-SUP720-BASE	SAD074502LM
7	24	CEF720 24 port 1000Mb SFP	WS-X6724-SFP	SAD0802009U
9	24	SFM-capable 24-port 100Base-FX Multi mode	WS-X6524-100FX- MM	SAL0802SEA4

Mod	Sub-Module	Model	Serial No.
1	Centralized Forwarding Card	WS-F6700-CFC	SAD080101TZ
3	IDS 2 accelerator board	WS-SVC- IDSUPG	ADEI50223623
5	Policy Feature Card 3	WS-F6K-PFC3A	SAD074504R0
5	MSFC3 Daughter board	WS-SUP720	SAD074304XK
7	Centralized Forwarding Card	WS-F6700-CFC	SAD074805SZ

		Power Capacity		
PS	Type	Watts	A @42V	Input Voltage
1	WS-CAC-4000W-US	3830.40	91.20	208VAC
2	WS-CAC-4000W-US	3830.40	91.20	208VAC

**C. South Terminal (Wrangell) Existing 6509 Configuration**

<b>Mod</b>	<b>Ports</b>	<b>Card Type</b>	<b>Model</b>	<b>Serial No.</b>
1	48	CEF720 48 port 10/100/1000Mb Ethernet	WS-X6748-GE-TX	SAD082207V 5
2	24	CEF720 24 port 100 Mb SFP	WS-X6724-SFP	SAD0819096 7
3	8	Firewall Blade	WS-SVC-FWM-1-K9	
4	8	Intrusion Detection System	WS-SVC-IDSM-2	SAD083307Z C
5	2	Supervisor Engine 720 (Active)	WS-SUP720-BASE	SAD082100D 5

<b>Mod</b>	<b>Sub-Module</b>	<b>Model</b>	<b>Serial No.</b>
1	Centralized Forwarding Card	WS-F6700- CFC	SAD080709BM
2	Centralized Forwarding Card	WS-F6700- CFC	SAD0815068R
4	IDS 2 accelerator board	WS-SVC- IDSUPG	ADEI43617983
5	Policy Feature Card 3	WS-F6K- PFC3A	SAD08200AY6
5	MSFC3 Daughter board	WS-SUP720	SAD082007D0

		<b>Power Capacity</b>		
<b>PS</b>	<b>Type</b>	<b>Watts</b>	<b>A @42V</b>	<b>Input Voltage</b>
1	WS-CAC-4000W-US	3795.12	90.36	208VAC
2	WS-CAC-4000W-US	3795.12	90.36	208VAC

**1.10 SPARE COMPONENTS REQUIRED**

A. Unless stated otherwise provide the following quantity of extra materials:

1. Environmentally hardened switch with power supply – 2
2. Layer Three Switch – 2



## PART 2 - PRODUCTS

### 2.1 CORE/DISTRIBUTION ETHERNET SWITCHES

- A. Provide a 6509 core/distribution switch in each Main Telecom Room of the North and South Terminals (two total) in a configuration matching that of the existing 6509 switches. Designate one switch in each Terminal as a red core switch with the second switch designated as a blue core switch. Match configuration of existing core switches except as described below:

<b>Cisco 6509 Core / Distribution Switch Configuration</b>	
General Configuration	
Host Name	Configure Switch names to reflect red or blue core / distribution and physical location.
IP Address	Configure Switch IP address using addresses provided by the Department.
Gateway	Configure gateway addresses as provided by the Department.
Passwords	Configure temporary enable, enable secret and Telnet Passwords. These will be changed by the Department upon acceptance of the network.
Banner MOTD	Configure Banner Message using security warning text provided by the Department.
Routed Protocol Support	IP Only.
Startup Configuration	Configure Switch to boot from NVRAM (local boot). Implement automated switch configuration offline management policy.
Switch Management	Move Switch Management from VLAN 1 to the Management VLAN used for existing switches.
NTP Service	Configure switch for Network Time Protocol sync with existing ANC NTP time servers. Include DST adjustment.
VLAN Trunking Protocol	Set all switches to VTP transparent mode
IOS Level	Update to latest version at completion of contract
SNMP Management	Configure SNMP management for each switch as required to match other Distribution Switches at ANC.
Quality of Service	Implement a network wide QOS Policy.
IP Routing Protocol	Enhanced Interior Gateway Protocol (EIGRP).

<b>Cisco 6509 Core / Distribution Switch Configuration</b>	
Multicast Routing Protocol	Sparse Mode Protocol Independent Multicast (PIM). Use best practice procedures for handling Multicast traffic.
IGMP Snooping	Enabled.
<b>Access Port Configuration</b>	
Port VLAN Assignment	Static as required for each subsystem or user group.
Speed & Duplex	Manual setting for fixed items such as access control servers and equipment. Auto speed and duplex for other transient equipment.
Storm Control	Multicast and Broadcast Storm Control set to 2% of bandwidth.
Spanning Tree	Portfast & BPDU Filtering enabled on all access ports.
Port Security	Use with best practices.
Power over Ethernet	Not required in initial deployment.
Port Quality of Service	Set at default values.
Unused Ports	Administratively disable all unused ports.
<b>Access Switch Uplink Ports</b>	
Port VLAN Assignment	Trunk VLANs as directed by the Department. For purposes of explaining required configuration VLANs 1-254 will be used. Actual VLANs will vary from this.
Speed & Duplex	1000Base-LX/LH Full Duplex.
Red Distribution Switch Spanning Tree Configuration	Set spanning tree as primary root for the first half of the VLANs, example 1-128, secondary root for VLANs example 129-254.
Blue Distribution Switch Spanning Tree Configuration	Set spanning tree as primary root for the first half of the VLANs, example 129-254, secondary root for VLANs example 1-128.
Red Distribution Switch HSRP Configuration	Set as HSRP primary for example VLANs 1-128, secondary for example VLANs 129-254 with preemptive fail back.
Blue Distribution Switch HSRP Configuration	Set as HSRP primary for example VLANs 129-254, secondary for example VLANs 1-128 with preemptive fail back.

<b>Cisco 6509 Core / Distribution Switch Configuration</b>	
Unidirectional Link Detection	Enabled.
<b>Core-to-Core Configuration</b>	
Spanning Tree Protocol	Enable Rapid Spanning Tree.
Trunking Protocol	802.1q.
Physical Protocol	1000Base-LX/LH.
Uni-Directional Link Detection	Enabled.

- B. Provide one new WS-X6724-SFP blade in each of the four core/distribution switches in slot number eight. Equip the South Terminal Core Switch blade with a full complement of twenty-four (24) 1000Base-LX/LH SFP modules. Equip the North Terminal Core Switch Blade with all required singlemode and multimode 100Base-FX SFPs for communications to the environmentally hardened switches and populate the remaining ports with 1000Base-LX/LH SFP modules. New blades shall be used for uplinks for new Interior Ethernet Switches.
- C. Acceptable Manufacturer/Model shall be Cisco 6509, no substitutions.

## 2.2 INTERIOR ETHERNET SWITCH

- A. Provide layer three switches at interior locations as shown on the Contract Drawings. Equip each switch with two 1000Base-LX/LH GBIC adapters and uplink to assigned ports on blade 8 of core switches. Configure all switch settings as follows:

<b>Cisco 3750 Access Switch Configuration</b>	
<b>General Configuration</b>	
Host Name	Configure Switch names as shown on drawings using naming convention specified by the Department.
IP Address	Configure Switch IP address using addresses provided by the Department.
Gateway	Configure default gateway addresses as required.
Passwords	Configure temporary enable, enable secret and Telnet Passwords. These will be changed by the Department upon acceptance of the network.

<b>Cisco 3750 Access Switch Configuration</b>	
Banner MOTD	Configure Banner Message using security warning text provided by the Department.
Protocols Configured	IP Only
Startup Configuration	Configure Switch to boot from Department assigned TFTP Server with NVRAM boot as secondary. Reverse boot sequence if instructed by the Department.
Switch Management	Move Switch Management from VLAN 1 to ANC Management VLAN as instructed by the Department.
Stacking	Configure Primary and Secondary Stack Controller.
NTP Service	Configure switch for Network Time Protocol sync with primary and secondary NTP time servers. Include DST adjustment.
VLAN Trunking Protocol	Set all switches to VTP client mode.
Stack Management	In any case where multiple switches are used in a stack, number switches 1 through 9 from top down in stack. Assign top switch priority 15 as stack master. Priority on other switches to remain priority 1.
IOS Level	Update to latest version at completion of contract.
SNMP Management	Configure SNMP management for each switch as required to match other layer two switch stacks at ANC.
Quality of Service	Use best practices.
IGMP Snooping	Enabled.
<b>Access Port Configuration</b>	
Port VLAN Assignment	Static on Department assigned Access Control VLAN.
Speed & Duplex	Manual setting for fixed items such as access control equipment. Auto speed and duplex for other transient equipment.
Storm Control	Multicast and Broadcast Storm Control set to 2% of bandwidth.
Spanning Tree	Portfast & BPDU Filtering enabled on all access ports.

<b>Cisco 3750 Access Switch Configuration</b>	
Port Security	Restrict ports to support only one MAC address at a time. Set for restricted violation mode.
Power over Ethernet	Provide PoE for future use.
Port Quality of Service	Default values.
Unused Ports	Administratively disable all unused ports.
Uplink Configuration	
Red Distribution Uplink	Trunk VLANs example 1-254.
Blue Distribution Uplink	Trunk VLANs example 1-254.
Spanning Tree Protocol	Rapid Spanning Tree.
Trunking Protocol	802.1q.
Physical Protocol	1000Base-LX/LH.
Uni-Directional Link Detection	Enabled.

- B. Acceptable Manufacturer/Model shall be Cisco 3750E-24-PD and 3750E-48-PD-F, no substitutions.

### 2.3 ENVIRONMENTALLY HARDENED SWITCH

- A. Provide industrial environmentally hardened switches at exterior locations as shown on the contract drawings. Provide a single 100Base-FX uplink from each switch to 100Base-FX ports on the North Terminal blue core / distribution switch for multimode connections. Provide a single 1000Base-LX/LH uplink from each switch to 1000Base-LX/LH ports on North Terminal blue core / distribution switch for singlemode connections. Configure these switches as closely as possible to the configuration specified for the 3750 access layer switches.
- B. Acceptable Manufacturer/Mode: Sixnet Model ET-5MS-ST for multimode, or approved equal. Sixnet Model ET-9MG-SS with single 1000LX/LH GBIC for singlemode, or approved equal. Provide all switches with 24VDC power supply.

### 2.4 DOMAIN CONTROLLER

- A. Provide two Domain Controller Servers with the characteristics as specified in 13710-2.7 at the locations as detailed on the Contract Drawings.
- B. Provide all required software and programming to configure the Domain Controllers for a single sign on solution utilizing Fingerprint Biometrics.

- C. The software shall allow the operator access to all applications on the workstation being logged onto, which the individual has the proper permissions and privileges, via the input of a single username, password and Fingerprint Biometrics verification.
- D. Domain Controllers shall be configured and programmed by a Microsoft certified programmer in the installation and programming of Domain Control Systems.
- E. Acceptable Manufacturer/Model shall be Bioscrypt VeriSoft Single Sign On Enterprise Edition Software, or approved equal.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. All switches shall be installed in a neat workmanlike manner. Neatly dress all fiber uplink and downlink cabling. Provide innerduct support between switch location and patch panel where no other supporting system is provided.
- B. Provide machine-imprinted label on all switches indicating the switch name. Do not include IP address for switch on label.

#### **3.2 GROUNDING**

- A. Ground all switches in accordance with manufacturer's grounding recommendations.

#### **3.3 TESTING**

- A. Testing shall be in accordance with Section 13730 – ACS Performance Verification Testing, Section 16995 – Electrical Commissioning, Section 16997 – Electrical Functional Testing Requirements and Section 16998 – Electrical Prefunctional Installation Examination Requirements.
- B. Provide all personnel, equipment, instrumentation, and supplies necessary to perform all testing.
- C. Test instruments shall have current NIST certification of calibration.
- D. Department representatives may witness any and all field tests at their discretion. The Contractor shall provide sufficient notification of tests to allow the Department to schedule the test observation.
- E. Contractor shall generate a test plan and submit to Department for approval.
- F. Contractor shall demonstrate functionality of each individual piece of equipment and features.
- G. Contractor shall demonstrate all LAN components working together and shall demonstrate functionality and LAN connectivity.

- H. Provide a 100-percent test of all access control switch ports by successfully pinging the associated access control server, equipment and devices.
- I. Provide a complete test of all uplinks for failover and pre-emptive fail back using a continuous ping and measuring the time between failing a link and resumption of traffic over the alternate uplink. Repeat the measurement when restoring each link. Record all test results and submit all test records to the Department.
- J. The LAN Contractor shall be responsible for performance testing of all LAN switches. The LAN Contractor shall report any infrastructure cabling non-performance issues.
- K. All core / distribution and edge switches shall be fully tested in accordance with the equipment manufacturer's recommendations. A test plan and procedures produced by the Contractor shall be used as the basis of this test. Test plan shall include test equipment capable of measuring throughput, jitter, and latency.
- L. Traffic distribution on all backbone and edge switch up-link circuits shall be monitored to ensure the correct routing of traffic.
- M. Aggregate backbone circuits shall be tested to ensure an equal distribution of traffic across each of the circuit elements included in the aggregate link. Each member of the aggregate circuit shall be individually disconnected to ensure that the traffic for the failed member is re-directed to the remaining members of the aggregate circuit.

**END OF SECTION 16749**

## **SECTION 16995**

### **ELECTRICAL COMMISSIONING**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

- A. Section Includes: Commissioning requirements for electrical systems and Access Control System.
- B. Related Sections:
  - 1. Section 01300 - Submittals
  - 2. Section 01310 - Work Schedules and Reports
  - 3. Section 01650 – Commissioning Requirements
  - 4. Sections 13710 - Access Control System
  - 5. Section 13720 - ACS Sequence and Cutover
  - 6. Section 13730 – ACS Performance Verification Testing
  - 7. Section 16010 – Electrical General Requirements
  - 8. Section 16745 – Telecommunications Distribution System
  - 9. Section 16747 – Telecommunications Optical Fiber Distribution
  - 10. Section 16749 – Local Area Network
  - 11. Section 16997 – Electrical Functional Testing Requirements
  - 12. Section 16998 - Electrical Prefunctional Installation Examination Requirements

##### **1.2 DESCRIPTION**

- A. This section describes requirements for commissioning equipment and associated systems specified under:
  - 1. ACS Equipment under Division 13
  - 2. Division 16.
- B. Refer to Section 01650 – Commissioning Requirements for additional requirements.
- C. Refer to Part 3 of this Section for a list of equipment and systems to be commissioned.
- D. Assist in preparation of the Commissioning Master Equipment and System List required in Section 01650. Submit to the Contractor's Commissioning Representative (CCR) information on all Division 16 equipment and systems and ACS in Division 13 required to complete the List as specified.
- E. Submit specific item entries related to commissioning of Division 16 equipment and systems and ACS in Division 13 to the CCR for inclusion in the CPM Schedule referenced in Section 01310. Identify all Division 16 equipment and systems and ACS in Division 13 that will be included in each completion



checkout item listed on the CPM.

- F. Identify and summarize all tests and certifications required for each piece of equipment and system specified in Division 16 and ACS in Division 13 and submit to the CCR.
- G. Identify and summarize all submittals required for each piece of equipment specified in Division 16 and ACS in Division 13. Submit summary to the CCR as required in Section 01300 and Section 01650.
- H. Prepare and submit Prefunctional Installation Examination Checklist Forms for each piece of equipment required to be commissioned under Division 16 and Division 13 (ACS) to the CCR. Refer to Sections 01650 and 16998. Coordinate with each trade and obtain all installation requirements and startup procedures from the manufacturer for each piece of equipment and include such requirements and procedures in the Form. Note that this requirement precedes compilation of O&M Manuals.
- I. Prepare and submit Functional Performance Test Checklist Forms for each piece of equipment required to be functionally tested under Divisions 13 (ACS) and 16 to the CCR. Refer to Sections 01650 and 16997.
- J. Identify and summarize all training required for each piece of equipment specified in Divisions 13 (ACS) and 16. Submit summary to the CCR as required in Section 01650.
- K. Verify that all Test Reports and Certifications required for Divisions 13 (ACS) and 16 equipment and systems in the summary above are completed and accepted.
- L. Coordinate compilation of O&M manuals with each trade. Verify the O&M submittals meet all requirements of the Specifications. Verify acceptance of all O&M manuals.
- M. Verify submittal and acceptance of all Prefunctional Installation Examination Checklist Forms for each piece of equipment required to be commissioned under Divisions 13 (ACS) and 16.
- N. Verify submittal and acceptance of all Functional Performance Test Checklist Forms for each piece of equipment and system required to undergo functional testing under Divisions 13 (ACS) and 16.
- O. Maintain a punchlist of all items specified under Divisions 13 (ACS) and 16 that require corrective action.
- P. Verify completion of training for all systems listed in the training summary required above.
- Q. Closeout submittals in accordance with Section 01650.

### 1.3 REFERENCES

- A. Model Commissioning Plan and Guide Specifications Version 2.05 - 1998, US Department of Energy - <http://www.peci.org/cx/mcpgs.html> or <http://www.eren.doe.gov/femp/techassist/bldgcomgd.html>

### 1.4 SUBMITTALS

- A. Coordinate with Section 01650 for submittal requirements for the commissioning process. Coordinate with the Contractor's Commissioning Representative (CCR) to prepare submittal information. Furnish the CCR with:
  - 1. List and resumes of proposed Electrical Systems Commissioning Representatives.
  - 2. Commissioning Master Equipment and System Lists.
  - 3. Prefunctional Installation Examination Checklists for all equipment commissioned under Divisions 13 (ACS) and 16 in accordance with Section 01650. Attach manufacturer's installation requirements and startup procedures to the form.
  - 4. Functional Performance Test Checklists for all equipment commissioned under Divisions 13 (ACS) and 16 in accordance with Section 01650.
  - 5. List of Equipment and System Training requirements.
  - 6. System training syllabuses for each piece of equipment and system requiring training.
  - 7. Submit copies of all completed Division 13 (ACS) and 16 Prefunctional Installation Examination Checklists and Functional Test Checklists for acceptance.
- B. Submit Qualification Requirements in accordance with Article 1.5 of this section.
- C. O&M Manuals.
- D. Closeout submittals in accordance with Section 01650.

### 1.5 QUALITY ASSURANCE

- A. Electrical Systems Commissioning Representatives
  - 1. Designate individuals who will be responsible for the completion of the commissioning activity for Division 13 and 16 equipment and systems. At a minimum, commissioning representatives of the following systems shall be named:
    - a. Access Control System.
    - b. Local Area Network.
    - c. All other Electrical systems.
  - 2. The individuals named shall have the following minimum qualifications:
    - a. 5 years experience in the system(s) for which he will be responsible.

The individual shall be thoroughly experienced in startup and commissioning of similar equipment.

- b. The individual shall have experience supervising others, reading drawings and specifications, and inspecting construction work.
- c. The individual shall have good communication and problem solving skills, and a knowledge of local conditions.
- d. Ability to develop or oversee development of all documentation required for the commissioning process, including:

- 1). CPM Schedule entries
- 2). Commissioning Master Equipment and System List
- 3). Prefunctional Installation Examination Checklists and Functional Test Checklists
- 4). Training Syllabuses
- 5). O&M manuals

- 3. Submit resume and telephone numbers of each individual. Resume shall show compliance with qualification requirements.

**B. Prefunctional Installation Examination Checklist**

- 1. Prepare and submit for approval Prefunctional Installation Examination Checklists (PE) for all commissioned equipment.
- 2. Refer to Section 16998 for a sample PE checklist.

**C. Functional Test Checklists**

- 1. Prepare and submit for approval Functional Test Checklists (FT) for all commissioned equipment and systems undergoing functional testing.
- 2. Refer to Section 16997 for functional testing requirements and sample FT checklists.

**D. Pre-Construction and Progress Meetings**

- 1. Attend Pre-Construction and Progress Meetings required in Section 01650.

## **1.6 SEQUENCING**

- A. Prefunctional Installation Examination Checklists (PE), test reports and certifications for equipment or systems shall be submitted and accepted prior to Functional Test Checkout of the equipment or system. Refer to the technical specifications for specific requirements.
- B. Complete all punchlist items prior to Functional Checkout of the system.
- C. O&M manuals shall be submitted and accepted at least 30 days prior to training sessions for the systems covered by manual.

## **1.7 SCHEDULING**

- A. Coordinate with Section 01650 the following items to be included in the CPM Schedule required under Section 01310:
  - 1. Submittals required under this Section.
  - 2. Prefunctional Installation Examination Checklists (PE) for each item of Work shall be identified in the CPM schedule. All equipment and systems included in the item of Work shall be identified in the Commissioning Master Equipment and System List with the corresponding CPM identifier.
  - 3. Functional Performance Test Checklists (FT) for each item of Work shall be identified in the CPM schedule. All equipment and systems included in the item of Work shall be identified in the Commissioning Master Equipment and System List with the corresponding CPM identifier and Functional Performance Test.
  - 4. Syllabus Submittals.
  - 5. Training Sessions.

## **PART 2 - PRODUCTS**

### **2.1 TEST EQUIPMENT**

- A. Provide all test equipment necessary to fulfill the testing requirements of this Division.
- B. Refer to Section 01650 for additional Division 16 requirements.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION AND TESTING**

- A. Notify DEPARTMENT of Installation Examinations or Functional Performance Tests schedules a minimum of 72 hours before they are to occur. Functional Tests shall not proceed without the presence of the DEPARTMENT'S representative unless authorized by the DEPARTMENT.
- B. Representatives from each discipline who are responsible for performing the commissioning activities shall be present at the scheduled activity.
- C. Perform and clearly document all startup procedures. Execute the Division 16 related portions of the Prefunctional Installation Examination Checklists for all commissioned equipment. Submit copies of all completed checklists for acceptance.
- D. Provide fully qualified technicians to execute starting of equipment and to execute the Functional Performance Tests. Ensure that they are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustments and problems solving. Failure of necessary technicians to be available will cause the test to be considered failed.

- E. The agency or installer that performs the tests of the individual systems required within each specification section shall provide instrumentation necessary to perform the test. Instruments shall be operated by the agency or installer as required, or additionally at the request of the DEPARTMENT.
- F. Provide all tools, ladders, and communication equipment required to properly access equipment and efficiently perform commissioning activity.
- G. Execute the Division 13 (ACS) and 16 related portions of the Functional Performance Test Checklist for all commissioned equipment and systems required to be functionally tested. Submit copies of all completed checklists for acceptance.
- H. Correct deficiencies and retest the equipment. Refer to Section 01650 regarding failed tests.

### 3.2 COMMISSIONED EQUIPMENT AND SYSTEMS LIST

- A. Commission the following equipment and systems. Refer to Sections 16997 and 16998 for requirements for Prefunctional Installation Examination Checklists and Functional Performance Test Checklists.

Section	Item	PE	FT
13710	Access Control System	X	X
16440	Disconnects	X	N/A
16450	Grounding Systems – Power	X	N/A
16450	Grounding Systems - Telecom	X	N/A
16460	Secondary Transformers	X	X
16470	Panelboards	X	X
16471	Transient Voltage Surge Suppression (TVSS)	X	X
16475	Overcurrent Protective Devices	X	X
16485	Motor Starters	X	N/A
16745	Telecommunications Distribution System	X	N/A
16747	Telecommunications Optical Fiber Distribution	X	N/A
16749	Local Area Network	X	X

### 3.3 TRAINING

- A. The CCR shall be responsible for training coordination and scheduling and ultimately to ensure that training is completed. Refer to Section 01650 for additional details.
- B. The CCR shall be responsible for overseeing and approving the content and adequacy of the training of Owner personnel for commissioned equipment.

Refer to Section 01650 for additional details.

- C. Electrical Commissioning Representatives shall have the following training responsibilities:
1. Provide the CCR with a training plan two weeks before the planned training according to the outline described in Section 01650.
  2. Provide designated Owner personnel with comprehensive training in the understanding of the systems and the operation and maintenance of each major piece of commissioned electrical equipment or system.
  3. Training shall start with classroom sessions, followed by hands on training on each piece of equipment, which shall illustrate the various modes of operation, including startup, shutdown, fire/smoke alarm, power failure, etc.
  4. During any demonstration, should the system fail to perform in accordance with the requirements of the O&M manual or sequence of operations, the system will be repaired or adjusted as necessary and the demonstration repeated.
  5. The appropriate trade or manufacturer's representative shall provide the instructions on each major piece of equipment. This person may be the start-up technician for the piece of equipment, the installing contractor or manufacturer's representative. Practical building operating expertise as well as in-depth knowledge of all modes of operation of the specific piece of equipment are required. More than one party may be required to execute the training.
  6. The training sessions shall follow the outline in the Table of Contents of the operation and maintenance manual and illustrate whenever possible the use of the O&M manuals for reference.
  7. Training shall include:
    - a. Use the printed installation, operation and maintenance instruction material included in the O&M manuals.
    - b. Include a review of the written O&M instructions emphasizing safe and proper operating requirements, preventative maintenance, special tools needed and spare parts inventory suggestions. The training shall include start-up, operation in all modes possible including degraded modes of operation, shut-down, seasonal changeover and any emergency or degraded operations procedures.
    - c. Discuss relevant health and safety issues and concerns.
    - d. Discuss warranties and guarantees.
    - e. Cover common troubleshooting problems and solutions.
    - f. Explain information included in the O&M manuals and the location of all plans and manuals in the facility.
    - g. Discuss any peculiarities of equipment installation or operation.
    - h. The format and training agenda in *Guidelines for Commissioning HVAC Systems*, ASHRAE, 1989R, 1996 is acceptable.
    - i. Classroom sessions shall include the use of overhead projections,

slides, video and audio taped material as appropriate or specified elsewhere.

8. Hands-on training shall include start-up, operation in all modes possible including degraded modes of operation, manual, shut-down and any emergency procedures and maintenance of all pieces of equipment.
9. Fully explain and demonstrate the operation, function and overrides of any local packaged controls, not *controlled* by the central control system.
10. Training shall occur after functional testing is complete, unless approved otherwise by the DEPARTMENT.
11. Divisions 13 and 16 shall provide training on each piece of equipment as noted in the appropriate specification sections.
12. A complete, organized set of all training materials (such as slides, videos, audio program, etc.) used during training shall be turned over to the DEPARTMENT at the end of each training segment.

### **3.4 DEFERRED TESTING**

- A. Refer to Section 01650 for requirements of deferred testing.

**END OF SECTION 16995**

## **SECTION 16997**

### **ELECTRICAL FUNCTIONAL PERFORMANCE TESTING REQUIREMENTS**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

- A. Section includes the requirements for Electrical Functional Performance Testing and Electrical Functional Test Forms.

##### **1.2 RELATED SECTIONS**

- A. 01650 – Commissioning Requirements
- B. 16995 – Electrical Commissioning
- C. 16998 – Electrical Prefunctional Installation Examination Requirements

##### **1.3 REFERENCES**

- A. Model Commissioning Plan and Guide Specifications Version 2.05 - 1998, US Department of Energy - <http://www.peci.org/cx/mcpgs.html> or <http://www.eren.doe.gov/femp/techassist/bldgcomgd.html>

##### **1.4 DESCRIPTION**

- A. Functional performance testing is a test of the dynamic function and operation of equipment and systems using manual (direct observation) or monitoring methods. The test requirements for each piece of equipment or system shall include items as noted below under Sample Forms under Quality Assurance.
- B. The following is a list of the equipment and system test requirements included in this section:
  - 1. Access Control System – 13700 Series
  - 2. Secondary Transformers - 16460
  - 3. Panelboards – 16470
  - 4. Transient Voltage Surge Suppression (TVSS) – 16471
  - 5. Overcurrent Protective Devices - 16475
  - 6. Local Area Network - 16749
  - 7. Compile and submit for approval Functional Performance Test Forms for equipment and systems required to be commissioned as scheduled in Section 16995.
- C. Coordinate with the Contractor's Commissioning Representative and the commissioning requirements outlined in Section 01650.
- D. Coordinate with the Electrical Commissioning Representatives and commissioning requirements outlined in Section 16995.



- E. The Forms shall include all functional testing requirements described in this Specification under Part 3.
- F. The functional testing requirements in this section complement and do not replace any testing requirements elsewhere in this division.

## **1.5 SUBMITTALS**

### **A. Electrical Functional Performance Test Forms**

- 1. Preliminary forms.
- 2. Final forms.

## **1.6 QUALITY ASSURANCE**

- A. Preparation of the Forms shall be under the supervision of the Electrical Systems Commissioning Representatives.
- B. The individuals preparing the forms shall have the minimum qualifications specified in Section 16995.
- C. Sample Forms
- D. Sample forms are available for guidance in the Model Commissioning Plan and Guide Specifications Version 2.05 - 1998, US Department of Energy - <http://www.peci.org/cx/mcpgs.html> or <http://www.eren.doe.gov/femp/techassist/bldgcomgd.html>. Refer to Part 3 for examples of available forms.
  - 1. Each Form shall include the following information:
    - a. The Electrical Commissioning Representatives required to execute the tests, under the direction of the CCR.
    - b. A list of the integral components being tested.
    - c. Prefunctional checklists associated with the components.
    - d. Functions and modes to be tested.
    - e. Required conditions of the test for each mode. Include requirements for false loading of systems where the system is designed for additional loads in future construction.
    - f. Required methods of testing.
    - g. Expected result for each test.
    - h. Special procedures.
    - i. Required monitoring.
    - j. Acceptance criteria.
    - k. Sampling strategies allowed.
    - l. Signature block for acceptance by CCR, required Mechanical and Electrical Commissioning Representatives, and the DEPARTMENT'S representative.

2. The following applicable generic prerequisite checklist items are required to be listed on each written functional test form and be completed and checked off by the CCR prior to functional testing.
  - a. Installation is complete in accordance with Section 16050-3.3 (NECA "National Electrical Installation Standards").
  - b. All related equipment has been started up and start-up reports and prefunctional checklists submitted and approved ready for functional testing.
  - c. All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints and schedules with debugging, loop tuning and sensor calibrations completed.

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Controls Contractor Signature

Date

3. All punchlist items for this equipment corrected.
4. These functional test procedures reviewed and approved by the DEPARTMENT.
5. These functional test procedures reviewed and approved by the Discipline under which the Work was accomplished.
6. Safeties and operating ranges reviewed and approved by the CCR.
7. Test requirements and sequences of operation attached.
8. Schedules and setpoints attached.
9. Sufficient clearance around equipment for servicing.
10. Record of all pre-test setpoints has been made in case they are changed to accommodate testing. Provide a check box to verify return to original values (control parameters, limits, delays, lockouts, schedules, etc.).
11. Other miscellaneous checks of the prefunctional checklist and start-up reports completed successfully.

## **PART 2 - PRODUCTS (NOT USED)**

## **PART 3 - EXECUTION**

### **3.1 ACCESS CONTROL SYSTEM (ACS)**

- A. Refer to Specification Sections 13710, 13720 and 13730.
- B. Parties Responsible to Execute or Participate in Functional Test:
  1. Contractor's Commissioning Representative
  2. Contractor's Division 16 Electrical Representatives
  3. Contractor's Division 13 ACS Representative
  4. Owner's Commissioning Representative
  5. Design Engineer

C. Integral Components or Related Equipment Being Tested:

1. Security Management System Software
2. ACS Interfaces (Closed-Circuit Television (CCTV) System, Digital Video Recording System (DVRs) and Intercom System)
3. Access Controllers (DBC)
4. ACS Communications:
  - a. Ethernet Local Area Network including Core and Edge switch redundancy
  - b. Redundant Communications (Additive Alternate No. 1) if accepted
5. ACS Servers including redundancy
6. ACS Workstations
7. Liquid Crystal Displays (LCDs)
8. KVM Extender Switches
9. ID Badge Printers
10. ACS Report Printers
11. ACS Smart Card Readers
12. ACS Biometrics Fingerprint Reader
13. Identification Scanners
14. Fiber Optic Intercom Transceivers
15. Intercoms
16. ACS Tamper Switches
17. Horn/Strobes
18. Uninterruptible Power Supplies
19. Electrical Door Hardware
20. Power Supplies
21. ACS Fire Alarm System Interface
22. Delayed Egress Door Device Interface and Operation

D. Prerequisites: The applicable prerequisite checklist items listed under Quality Assurance in the beginning of Section 16997 shall be listed on each functional test form and checked off prior to functional testing.

E. Items Required To Be Tested:

1. The following testing requirements complement and do not replace or diminish any testing requirements elsewhere in Division 13.
  - a. Document and witness startup, checkout and testing by factory representatives as specified and including the following:
    - 1). Functionally test the ACS software and system interfaces as specified elsewhere in Division 13 and 16.
    - 2). Functionally test security portal operation for the following:
      - a) Card read operation including audio/visual indicator annunciation.

- b) Correct status annunciation for all associated portal alarms on existing ACS headend workstations as detailed in Specification Section 13720-3.8.E.
  - c) Operation of associated door locks and door position switches.
  - d) Proper operation of egress doors under all modes of operation, normal, emergency, fire alarm, power failure, etc.
- 3). Test complete system operation and functionality during performance verification testing as specified in Section 13730 – ACS Performance Verification Testing.
  - 4). Conduct endurance testing of ACS as specified in Section 13730 – ACS Performance Verification Testing.

F. Acceptance Criteria:

- 1. For the conditions, sequences and modes tested, the Access Control System, integral components and related equipment shall respond to changing conditions and parameters appropriately as expected, as specified and according to acceptable operating practice.

G. Sampling Strategy for Identical Units:

- 1. None. Test all.

### **3.2 SECONDARY TRANSFORMERS**

A. Refer to Specification Section 16460.

B. Parties Responsible to Execute or Participate in Functional Test:

- 1. Contractor's Commissioning Representative
- 2. Contractor's Electrical Representatives

C. Integral Components or Related Equipment Being Tested:

- 1. Secondary Transformers
- 2. Power Distribution System

D. Prerequisites: The applicable prerequisite checklist items listed under Quality Assurance in the beginning of Section 16997 shall be listed on each functional test form and checked off prior to functional testing.

**E. Items Required To Be Tested:**

1. The following testing requirements complement and do not replace any testing requirements elsewhere in this Division.
  - a. Document and witness checkout and testing as specified and including the following:
    - 1). Adjust transformer taps to provide rated voltage at the secondary bus with all connected loads "on", except the no load secondary line to neutral voltage shall not exceed 125 volts on nominal 120 volt phases.
    - 2). Test sound levels per manufacturer's criteria. Sound levels shall not exceed the following:
      - a) 15 to 50 kVA: 45 dB
      - b) 51 to 150 kVA: 50 dB
    - 3). Conduct a thermographic analysis of all terminations (bolted and compression) under load conditions.

**F. Acceptance Criteria:**

1. The transformers operate appropriately as expected, as specified and according to acceptable operating practice.

**G. Sampling Strategy for Identical Units:**

1. None. Test all.

**3.3 PANELBOARDS, TVSS AND OVERCURRENT PROTECTIVE DEVICES**

A. Refer to Specification Section 16470, 16471 and 16475.

B. Parties Responsible to Execute or Participate in Functional Test

1. Contractor's Commissioning Representative
2. Contractor's Electrical Representative
3. Owner's Commissioning Representative
4. Design Engineer

C. Integral Components or Related Equipment Being Tested

1. Panelboards
2. Overcurrent Protective Devices
3. TVSS devices
4. Power Distribution System

D. Prerequisites: The applicable prerequisite checklist items listed under Quality Assurance in the beginning of Section 16997 shall be listed on each functional test form and checked off prior to functional testing.

**E. Items Required To Be Tested**

1. The following testing requirements complement and do not replace any testing requirements elsewhere in this Division.
  - a. Document and witness startup, checkout and testing as specified and including the following:
    - 1). Demonstrate operation of all operating mechanisms. Verify that operating mechanisms are adjusted for free mechanical movement per manufacturer's specifications.
    - 2). Conduct a thermographic analysis of all terminations (bolted and compression) under load conditions.
    - 3). Verify that circuit breaker trip and time delay settings are adjusted in accordance with the specified coordination study unless otherwise directed by the DEPARTMENT (where applicable).
    - 4). Conduct a performance test of the ground-fault protection systems (where applicable).
    - 5). Verify that TVSS devices are properly installed and operable (where applicable).

**F. Acceptance Criteria**

1. The panelboards, integral components and related equipment shall operate appropriately as expected, as specified and according to acceptable operating practice.

**G. Sampling Strategy for Identical Units**

1. Panelboards with TVSS devices: None. Test all.

**3.4 LOCAL AREA NETWORK**

**A. Refer to Specification Section 16749.**

**B. Parties Responsible to Execute or Participate in Functional Test**

1. Contractor's Commissioning Representative
2. Contractor's Electrical Representatives
3. Owner's Commissioning Representative
4. Design Engineer

**C. Integral Components or Related Equipment Being Tested**

1. Core/Distribution Switches
2. Ethernet Switches
3. Environmentally Hardened Switches
4. Domain Controllers

- D. Prerequisites: The applicable prerequisite checklist items listed under Quality Assurance in the beginning of Section 16997 shall be listed on each functional test form and checked off prior to functional testing.
- E. Items Required To Be Tested
  - 1. Test functional operation of all system equipment, devices, interfaces, software and integration in accordance with the Engineer approved test procedures as specified in Section 13730 - ACS Performance Verification Testing.
- F. Acceptance Criteria
  - 1. For the conditions, sequences and modes tested, the Local Area Network, integral components and related equipment shall respond to changing conditions and parameters appropriately as expected, as specified and according to acceptable operating practice.
- G. Sampling Strategy for Identical Units
  - 1. None. Test all.

### 3.5 SAMPLE FORM

- A. The sample FT procedures displayed in a form format here are intended to provide an example of a format and an indication of the level of detail of the required testing and documentation for various equipment types. They have not been tailored to this project. Other forms and formats are acceptable if they comply with the level of detail, clarity and intent of all the commissioning specifications. The CCR and Mechanical and Electrical Commissioning Representatives shall use the functional testing requirements in Section 16997 and the testing protocols specified in Sections 01650 and 16995 for developing site-specific functional test procedures and forms for this project. For illustrative purposes, sequences of operation associated with a few pieces of the equipment for which tests are included are also provided.

B. SAMPLE FUNCTIONAL TESTS (Examples only, not prepared for this project)

**Functional Test**

**Project:** \_\_\_\_\_

**FT-\_\_\_\_\_ EXTERIOR LIGHTING CONTROLS**

**1. Participants**

Party

Participation

\_\_\_\_\_  
\_\_\_\_\_

Party filling out this form and witnessing testing \_\_\_\_\_

Date of test \_\_\_\_\_

**2. Prerequisite Checklist**

- a. \_\_\_ All control system functions for this and all interlocking systems are programmed and operable per contract documents, including final setpoints, schedules, debugging and fine tuning of photo-cell parameters.

\_\_\_\_\_  
Controls Contractor Signature or Verbal                      Date

- b. \_\_\_ All A/E punchlist items for this equipment corrected.
- c. \_\_\_ Safeties and operating ranges reviewed.
- d. \_\_\_ Test requirements and sequences of operation attached.
- e. \_\_\_ Schedules and setpoints attached.
- f. \_\_\_ Have all energy savings control strategies, setpoints and schedules been incorporated that this equipment and control system are capable of? If not, list recommendations below.
- g. \_\_\_ **BAS Program Review.** Review the BAS software control program(s) for this equipment. Parameters, setpoints and logic sequences appear to follow the specified written sequences.
- h. \_\_\_ Schedule of fixtures on each control type (Parking or Security) has been reviewed.
- i. \_\_\_ Record of All Values for Current Setpoints (SP), Control Parameters, Limits, Delays, Lockouts, Schedules, Etc. Changed to Accommodate Testing:



Parameter	Pre-Test Values	Returned to Pre-Test Values <input checked="" type="checkbox"/>
Parking lot lights schedule	<u>ON</u> by photo cell  <u>OFF</u> by sched: _____	
Photo-cell BAS parameters		

Parameter	Pre-Test Values	Returned to Pre-Test Values <input checked="" type="checkbox"/>
Exterior security lights schedule	<u>ON</u> by photo cell  <u>OFF</u> by photo-cell	

- 3. Sensor Calibration Checks.** Check the sensors listed below for calibration and adequate location. This is a sampling check of calibrations done during prefunctional checklisting. Test the packaged controls and BAS readings.

---NONE--

#### 4. Device Calibration Checks.

---NONE---

#### 5. Verification of Misc. Prefunctional Checks.

Misc. site checks of the prefunctional checklist and startup reports completed successfully. Pass? Y / N \_\_\_\_\_

\_\_\_ Photo-cell (PC) mounted securely. \_\_\_ PC mounted where it won't be tampered with. \_\_\_  
PC mounted so it won't become dirty easily. \_\_\_ PC accessible for servicing.

#### 6. Functional Testing Record

Proced. No. & Spec. Seq. ID <sup>1</sup>	Req ID No. <sup>2</sup>	Test Procedure <sup>3</sup> (including special conditions)	Expected and Actual Response <sup>4</sup> [Write ACTUAL response in brackets or circle]	Pass Y/N & Note #
1		Near dusk, observe exterior lights until they come ON. (Witnessed by Owner's Rep: _____)	<u>All</u> exterior lights come on at dusk, before dark, but not when still very light.	
2		a) Change the Parking Lot light schedule OFF to be in 5 minutes.  b) Return schedule to normal.	a) Observe that the parking lot lights, designated by the approved schedule, shut OFF. Designated signage remains ON. b) Schedule returned to normal.	

Proced. No. & Spec. Seq. ID <sup>1</sup>	Req ID No. <sup>2</sup>	Test Procedure <sup>3</sup> (including special conditions)	Expected and Actual Response <sup>4</sup> [Write ACTUAL response in brackets or circle]	Pass Y/N & Note #
3		Before daylight in the morning, observe the security lights ON. Wait until dawn. (Witnessed by Owner's Rep: _____)	When sufficiently light, Security Lights and signage lights shut OFF.	
4	--	Return all changed control parameters and conditions to their pre-test values <sup>5</sup>	Check off in Section 2 above when completed	

Record Foot Notes

<sup>1</sup>Sequences of operation specified in Contract Documents (attached).

<sup>2</sup>Mode or function ID being tested, per testing requirements section of the project Specifications.

<sup>3</sup>Step-by-step procedures for manual testing, trend logging or data-logger monitoring.

<sup>4</sup>Include tolerances for a passing condition.

<sup>5</sup>Record any permanently changed parameter values and submit to Owner.

-- END OF TEST --

END OF SECTION 16997

**SECTION 16998**  
**ELECTRICAL PREFUNCTIONAL INSTALLATION**  
**EXAMINATION REQUIREMENTS**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section includes the requirements for Electrical Prefunctional Installation Examinations.
- B. Related Sections:
  - 1. 01650 – Commissioning Requirements
  - 2. 16995 – Electrical Commissioning
  - 3. 16997 – Electrical Functional Performance Test Requirements

**1.2 REFERENCES**

- A. Model Commissioning Plan and Guide Specifications Version 2.05 - 1998, US Department of Energy - <http://www.peci.org/cx/mcpgs.html> or <http://www.eren.doe.gov/femp/techassist/bldgcomgd.html>

**1.3 SYSTEM DESCRIPTION**

- A. Compile and submit for approval Electrical Prefunctional Installation Examination Forms for equipment and systems required to be commissioned as scheduled in Section 16995.
- B. The Forms shall include manufacturer's installation and startup requirements. The Forms shall also include test and certification requirements for systems and equipment included in the technical specifications.
- C. Coordinate with the Contractor's Commissioning Representative (CCR) and the commissioning requirements outlined in Section 01650.
- D. Coordinate with the various Electrical Commissioning Representatives and commissioning requirements outlined in Section 16995.
- E. The Forms shall include all prefunctional examination requirements described in this Specification under Part 3.
- F. The prefunctional examination requirements in this section complement and do not replace any testing requirements elsewhere in this division.

**1.4 SUBMITTALS**

- A. Refer to Section 01650 and Section 16995 for submittal requirement information.

**B. Electrical Prefunctional Installation Examination Forms.**

1. Preliminary forms.
2. Final forms. Attach manufacturer's installation and startup instructions to each form.

**1.5 QUALITY ASSURANCE**

**A. Preparation of the Forms shall be under the supervision of the Electrical Systems Commissioning Representatives.**

**B. The individuals preparing the forms shall have the minimum qualifications specified in Section 16995.**

**C. Sample Forms**

1. Sample forms are available for reference for informational purposes in the Model Commissioning Plan and Guide Specifications referenced in Article 1.2 above.
2. A sample form is attached to the Section for informational purposes only. These forms are generic in nature. They were NOT developed for use on this project.
3. Each Form shall include the following information:
  - a. A listing of Contractor's Electrical Commissioning Representatives required to verify installation requirements have been met, under the direction of the CCR. Provide line for signature by the CCR and Electrical Commissioning Representatives.
  - b. A list of trade or system technicians required for equipment startup.
  - c. A list of the integral components being examined.
  - d. A list of all required tests and certificates required in the technical specifications related to the equipment or system being examined. Refer to Section 01650 regarding submittal of required information.
  - e. Complete list of manufacturer's installation requirements. Include all manufacturer checklist items.
  - f. Manufacturer startup requirements. Include all manufacturer checklist items.
  - g. Operational tests that are a prerequisite to the Functional Performance Test.
  - h. Special procedures and requirements.

**PART 2 - PRODUCTS - NOT USED**

**PART 3 - EXECUTION**

**3.1 SAMPLE PREFUNCTIONAL EXAMINATION FORM**

- A. This section contains a representative Prefunctional Checklist in a form format (PC). The PC procedures displayed here are intended to provide an example

of a format and an indication of the level of detail for the required prefunctional checklists and documentation for various equipment types. On each checklist, a column is provided that should be filled out by the Contractor assigning responsibility for that line item to a trade. These checklists do not take the place of the manufacturer's recommended checkout and start-up procedures or report. Some checklist procedures may be redundant of some checkout procedures that will be documented on typical factory field checkout sheets. Double documenting is required in those cases. Refer to Section 01650 for additional requirements regarding prefunctional checklists, startup and initial checkout. Items that do not apply should be noted along with the reasons on the form.

B. Sample Form

## Prefunctional Checklist

Project \_\_\_\_\_

PC-\_\_\_\_\_ VARIABLE FREQUENCY DRIVE on  
\_\_\_\_\_

### 1. Submittal / Approvals

**Submittal.** The above equipment and systems integral to them are complete and ready for functional testing. The checklist items are complete and have been checked off only by parties having direct knowledge of the event, as marked below, respective to each responsible contractor. This prefunctional checklist is submitted for approval, subject to an attached list of outstanding items yet to be completed. A Statement of Correction will be submitted upon completion of any outstanding areas. None of the outstanding items preclude safe and reliable functional tests being performed.

_____ Mechanical Contractor	_____ Date	_____ Controls Contractor	_____ Date
_____ Electrical Contractor	_____ Date	_____ Sheet Metal Contractor	_____ Date
_____ TAB Contractor	_____ Date	_____ General Contractor	_____ Date

Prefunctional checklist items are to be completed as part of startup & initial checkout, preparatory to functional testing.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- Items that do not apply shall be noted with the reasons on this form (N/A = not applicable, BO = by others).
- If this form is not used for documenting, one of similar rigor shall be used.
- Contractors assigned responsibility for sections of the checklist shall be responsible to see that checklist items by their subcontractors are completed and checked off.

- "Contr." column or abbreviations in brackets to the right of an item refer to the contractor responsible to verify completion of this item. A/E = architect/engineer, All = all contractors, CA = commissioning agent, CC = controls contractor, EC = electrical contractor, GC = general contractor, MC = mechanical contractor, SC = sheet metal contractor, TAB = test and balance contractor, \_\_\_\_ = \_\_\_\_\_

**Approvals.** This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted below.

\_\_\_\_\_  
 Commissioning Agent

\_\_\_\_\_  
 Date

\_\_\_\_\_  
 Owner's Representative

\_\_\_\_\_  
 Date

## 2. Requested documentation submitted

Check if Okay. Enter comment or note number if deficient.

Check	Equip Tag->						Contr.
Manufacturer's cut sheets							
Performance data (fan curves, coil data, etc.)							
Installation and startup manual and plan							
Sequences and control strategies							
O&M manuals							

- **Documentation complete as per contract documents for given trade.....** ☐ YES ☐ NO

## 3. Model verification

[Contr = \_\_\_\_\_]

1 = as specified, 2 = as submitted, 3 = as installed. Check if Okay. Enter note number if deficient.

Equip Tag--->					
Manuf.	1				
	2				
	3				
Model	1				
	2				
	3				
Serial #	3				
Capacity	1				
	2				
	3				

- **The equipment installed matches the specifications for given trade .....** ☐ YES ☐ NO

#### 4. Installation Checks

Check if Okay. Enter comment or note number if deficient.

Check	Equip Tag->						Contr.
<b>General Installation</b>							
Permanent label affixed							
Securely mounted							
Drive location not subject to excessive temperatures							
Drive location not subject to excessive moisture or dirt							
Drive size matches motor size							
Pilot lights functioning							
VFD wired to controlled equipment							
<b>Programming and Controls</b>							
Internal setting designating the model is correct							
Input of motor FLA represents 100% to 105% of motor FLA rating							
Appropriate Volts vs Hz curve is being used							
Accel and decel times are around 10-50 seconds, except for special applications. Record actual for each unit.							
Lower frequency limit at 0 for VAV fans and around 10-30% for chilled water pumps. Record actual for each unit.							
Upper frequency limit set at 100%, unless explained otherwise							
VFD interlocked to control system							
Static or differential pressure sensor or other controlling sensor properly located and per drawings							
Controlling sensor calibrated							
Unit is programmed with full written programming record submitted							
RPM readout in BAS verified with VFD readout							
All control devices, pneumatic tubing and wiring complete							
Specified sequences of operation and operating schedules have been implemented with all variations documented							
Specified point-to-point checks have been completed and documentation record submitted for this system							
<b>Final</b>							
Startup report completed with this checklist attached							
Safeties installed and safe operating ranges for this equipment provided to the commissioning agent							

• The checklist items of Part 4 are all successfully completed for given trade.      YES      NO

-- END OF CHECKLIST --



**END OF SECTION 16998**



