MULTI-STEP BIDDING PROCESS
FOR
CONTRACTORS

Request For Solicitation For Construction Services

Stage II – General Contractors Bidders List FY10

September 28, 2009

ELEVATOR MODERNIZATION OGDEN REGIONAL CENTER

DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT
OGDEN, UTAH

DFCM Project No. 09071310

JSA Architects
6465 South 3000 East, Suite 205
Salt Lake City, Utah 84121

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Technical Specifications:
Drawings:

Current copies of the following documents are hereby made part of these contract documents by reference. These documents are available on the DFCM web site at http://dfcm.utah.gov/StdDocs/index.html "Standard Documents" – "Reference Documents I" – "Item 6. Supplemental General Conditions" or are available upon request from DFCM:

DFCM Supplemental General Conditions dated July 1, 2009 *
DFCM Supplemental General Conditions dated July 15, 2008
DFCM General Conditions dated May 25, 2005

*** NOTE: THE NEW SUPPLEMENTAL GENERAL CONDITIONS EFFECTIVE JULY 1, 2009 ADDRESSING HEALTH INSURANCE AND IMMIGRATION ARE REFERENCED AT THE LINK ABOVE.**

The Agreement and General Conditions dated May 25, 2005 have been updated from versions that were formally adopted and in use prior to this date. The changes made to the General Conditions are identified in a document entitled Revisions to General Conditions that is available on DFCM's web site at http://dfcm.utah.gov

INVITATION TO BID

ONLY FIRMS PRE-QUALIFIED DURING STAGE I OF THE RFS ARE ALLOWED TO BID ON THIS PROJECT

The State of Utah - Division of Facilities Construction and Management (DFCM) is requesting bids for the construction of the following project:

ELEVATOR MODERNIZATION - OGDEN REGIONAL CENTER
DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT – OGDEN, UTAH
DFCM PROJECT NO: 09071310

Project Description: The work includes modernization of three existing passenger elevators and one existing service elevator including code upgrades, electrical, fire detection and interior car improvements. Also included are minor upgrades to associated elevator lobbies including lay-in ceiling and painted walls. Construction Cost Estimate: $875,000.00

Company	Contact	Fax	Company	Contact	Fax
Acme Construction	Buster Hafen	801-280-6423	Interior Constr Specialists	Penn Owens	801-568-1490
Allstate Construction	Brian Ebert	801-563-3373	Interwest Construction	Max Griffin	801-936-1330
Arnell-West, Inc.	Mark Hintze	801-975-9967	J. Lyne Roberts & Sons	Scott Roberts	801-374-2073
Ascent Construction	Brad Knowlton	801-299-0663	Jacobsen Construction	Mike Sivulich	801-973-7496
Bailey Construction Co	Tracy Bailey	435-753-3636	JC Construction, Inc	John Cecala	801-262-7966
Benstog Construction	Patrick Benstog	801-399-1335	JL Hardy Construction	Jeff Ames	801-975-1008
Big-D Construction	Ryan Carter	801-415-6048	Kendrick Brothers Constr	Tom Kendrick	801-262-8939
Boyd Martin Constr	Boyd Martin	702-454-3735	M.W. Construction, Inc	Bill Shuldberg	435-245-4660
Broderick and Henderson	Gary Broderick	801-225-4697	McCullough Engr & Contr	Jamie McCullough	801-466-4989
Brubaker Construction	Benjamin Hickman	801-561-5511	Mecham Brothers, Inc	Scott Mecham	801-985-0423
Bud Mahas Construction	Steve Mahas	801-531-0314	New Star General Contr	David Milne	801-972-6002
Cal Wadsworth Constr	Cal Wadsworth	801-208-1975	Paulsen Construction	Dave Black	801-484-9730
Cameron Construction	David Hill	801-268-3678	Peck Ormsby Constr	Ron Peck	801-766-1715
Chad Husband Constr	Richard Marshall	801-886-1784	R&O Construction	Ken Warnick	801-399-1480
CK Constr & Svc Corp	Ryan Shurtleff	801-732-8956	Raymond Construction	Doug Raymond	435-752-2914
Clear Construction	Jordan Boyer	801-606-7757	Rueckert Construction	Ken Rueckert	801-253-1774
CSM Construction, Inc	Troy Noorda	801-280-2813	Saunders Construction.	Edward Saunders	801-782-7856
Darrell W. Anderson .	James Anderson	435-752-7606	Spindler Construction	Gary Stevens	435-753-0728
Daw Construction	Mike Jacks	801-553-2345	Stallings Construction	Reed Stallings	801-266-3413
Dawson Development	Brandon Dawson	801-446-2470	Stout Building Contr	Nate Lechtenberg	801-294-5085
Dutson Building, Inc.	Tony Yearego	801-978-0300	Valley Design and Constr	Bob Petersen	801-927-9544
Eckman Mitchell Constr	Zach Eckman	801-908-0205	Velocity Construction	Gavin Larkin	435-586-4968
Entelen Design-Build	Steven Burt	801-542-8093	Veritas, Inc.	Dan Parkinson	801-572-5899
Garff Construction Corp	Phil Henriksen	801-972-1928	Wade Payne Constr	Wade Payne	801-226-7772
Hales & Warner Constr.	Clifford Hales	801-798-7320	Wadman Corporation	Chris Hipwell	801-621-7232
Hellas Construction	Reed Seaton	801-397-5586	Westland Construction	Kyle Houghton	801-374-6060
Hogan and Associates	Aaron Metcalfe	801-951-7100	Zwick Construction	Eric Calder	801-485-2402
Hughes General Contr	Dan Pratt	801-295-0530			

The bid documents will be available at 12:00 Noon on Monday, September 28, 2009 in electronic format only on CDs from DFCM at 4110 State Office Building, Salt Lake City, Utah 84114, telephone 801-538-3018 and on the DFCM web page at http://dfcm.utah.gov. For questions regarding this project, please contact Bob Anderson, Project Manager, DFCM, at 801-652-6754. No others are to be contacted regarding this project. A **MANDATORY** pre-bid meeting and site visit will be held at 1:00 PM on Wednesday, October 7, 2009 in the 1st Floor Conference Room, Ogden Regional Center, 2540 Washington Blvd., Ogden, Utah. All pre-qualified prime contractors wishing to bid on this project must attend this meeting. Bids must be submitted by 3:00 PM on Tuesday, October 20, 2009 to DFCM, 4110 State Office Building, Salt Lake City, Utah 84114. Bids will be opened and read aloud in the DFCM Conference Room, 4110 State Office Building, Salt Lake City, Utah. Note: Bids must be received at 4110 State Office Building by the specified time. The contractor shall comply with and require all of its subcontractors to comply with the license laws as required by the State of Utah. A bid bond in the amount of five percent (5%) of the bid amount, made payable to the Division of Facilities Construction and Management on DFCM's bid bond form, shall accompany the bid. The Division of Facilities Construction & Management reserves the right to reject any or all bids or to waive any formality or technicality in any bid in the interest of the State.

DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT
MARLA WORKMAN CONTRACT COORDINATOR
4110 State Office Bldg., Salt Lake City, Utah 84114

STAGE II - MULTI-STEP BIDDING PROCESS

ONLY FIRMS PRE-QUALIFIED DURING STAGE I OF THE RFS ARE ALLOWED TO BID ON THIS PROJECT

1. Invitational Bid Procedures

The following is an overview of the invitational bid process. More detailed information is contained throughout the document. Contractors are responsible for reading and complying with all information contained in this document.

Notification: DFCM will notify each registered pre-qualified firm (via fax or e-mail) when a project is ready for Construction Services and invite them to bid on the project.

Description of Work: A description of work or plans/specifications will be given to each contractor. If required, the plans and specifications will be available on the DFCM web page at http://dfcm.utah.gov and on CDs from DFCM, at 4110 State Office Building, Salt Lake City, Utah 84114.

Schedule: The Stage II Schedule shows critical dates including the mandatory pre-bid site meeting (if required), the question and answer period, the bid submittal deadline, the subcontractor list submittal deadline, etc. Contractors are responsible for meeting all deadlines shown on the schedule.

Mandatory Pre-Bid Site Meeting: If a firm fails to attend a pre-bid site meeting labeled "Mandatory" they will not be allowed to bid on the project. At the mandatory meeting, contractors may have an opportunity to inspect the site, receive additional instructions and ask questions about project. The schedule contains information on the date, time, and place of the mandatory pre-bid site meeting.

Written Questions: All questions must be in writing and directed to DFCM's project manager assigned to this project. No others are to be contacted regarding this project. The schedule contains information on the deadline for submitting questions.

Addendum: All clarifications from DFCM will be in writing and issued as an addendum to the RFS. Addenda will be posted on DFCM's web site at http://dfcm.utah.gov. Contractors are responsible for obtaining information contained in each addendum from the web site. Addenda issued prior to the submittal deadline shall become part of the bidding process and must be acknowledged on the bid form. Failure to acknowledge addenda may result in disqualification from bidding.

Submitting Bids: Bids must be submitted to DFCM 4110 State Office Building, Salt Lake City, Utah 84114 by the deadline indicated on the schedule. Bids submitted after the deadline will not be accepted. Bids will be opened at DFCM on the date, time, and place indicated on the schedule.

Subcontractors List: The firm selected for the project must submit a list of all subcontractors by the deadline indicated on the schedule contained in this document.

Pre-qualified List of Contractors: Contractors shall remain on DFCM's list of pre-qualified contractors provided: (a) they maintain a performance rating of 3.5 or greater on each project, (b) they are not suspended for failure to comply with requirements of their contract, (c) the firm has not undergone a significant reorganization involving the loss of key personnel (site superintendents, project managers, owners, etc.) to a degree such that the firm no longer meets the pre-qualification requirements outlined in Stage I, (d) the financial viability of the firm has not significantly changed, and (e) the firm is not otherwise disqualified by DFCM. Note: If a contractor fails to comply with items (a) through (e) above,

they may be removed from DFCM's list of pre-qualified contractors following an evaluation by a review committee. Contractors will be given the opportunity to address the review committee before a decision is made. Pre-qualified contractors are ONLY authorized to bid on projects within the discipline that they were originally pre-qualified under.

2. Drawings and Specifications and Interpretations

Drawings, specifications and other contract documents may be obtained as stated in the Invitation to Bid. If any firm is in doubt as to the meaning or interpretation of any part of the drawings, specifications, scope of work or contract documents, they shall submit, in writing, a request for interpretation to the authorized DFCM representative by the deadline identified in the schedule. Answers to questions and interpretations will be made via addenda issued by DFCM. Neither DFCM or the designer shall be responsible for incorrect information obtained by contractors from sources other than the official drawings/specifications and addenda issued by DFCM.

3. Product Approvals

Where reference is made to one or more proprietary products in the contract documents, but restrictive descriptive materials of one or more manufacturer(s) is referred to in the contract documents, the products of other manufacturers will be accepted, provided they equal or exceed the standards set forth in the drawings and specifications and are compatible with the intent and purpose of the design, subject to the written approval of the Designer. Such written approval must occur prior to the deadline established for the last scheduled addendum to be issued. The Designer's written approval will be included as part of the addendum issued by DFCM. If the descriptive material is not restrictive, the products of other manufacturers specified will be accepted without prior approval provided they are compatible with the intent and purpose of the design as determined by the Designer.

4. Addenda

All clarifications from DFCM will be in writing and issued as an addendum to the RFS. Addenda will be posted on DFCM's web site at http://dfcm.utah.gov. Contractors are responsible for obtaining information contained in each addendum from the web site. Addenda issued prior to the submittal deadline shall become part of the bidding process and must be acknowledged on the bid form. Failure to acknowledge addenda shall result in disqualification from bidding. DFCM shall not be responsible for incorrect information obtained by contractors from sources other than official addenda issued by DFCM.

5. Financial Responsibility of Contractors, Subcontractors and Sub-subcontractors

Contractors shall respond promptly to any inquiry in writing by DFCM to any concern of financial responsibility of the Contractor, Subcontractor or Sub-subcontractor. Failure to respond may result in suspension from DFCM's list of pre-qualified contractors.

6. Licensure

The Contractor shall comply with and require all of its Subcontractors to comply with the license laws as required by the State of Utah.

7. Permits

In concurrence with the requirements for permitting in the general conditions, it is the responsibility of the contractor to obtain the fugitive dust plan requirements from the Utah Division of Air Quality and the SWPPP requirements from the Utah Department of Environmental Quality and submit the completed forms and pay any permit fee that may be required for this specific project. Failure to obtain the required permit may result in work stoppage and/or fines from the regulating authority that will be the sole responsibility of the contractor. Any delay to the project as a result of any such failure to obtain the permit or noncompliance with the permit shall not be eligible for any extension in the Contract Time.

8. Time is of the Essence

Time is of the essence in regard to all the requirements of the contract documents.

9. Bids

Before submitting a bid, each bidder shall carefully examine the contract documents; shall visit the site of the work; shall fully inform themselves as to all existing conditions and limitations; and shall include in the bid the cost of all items required by the contract documents including those added via addenda. If the bidder observes that portions of the contract documents are at variance with applicable laws, building codes, rules, regulations or contain obvious erroneous or uncoordinated information, the bidder shall promptly notify the DFCM Project Manager prior to the bidding deadline. Changes necessary to correct these issues will be made via addenda issued by DFCM.

The bid, bearing original signatures, must be typed or handwritten in ink on the Bid Form provided in the procurement documents and submitted in a sealed envelope at the location specified by the Invitation to Bid prior to the published deadline for the submission of bids.

A bid bond properly signed by a qualified surety, as indicated on the DFCM Bid Bond form provided along with this Instruction to Bidders, in the amount of 5% of the bid, shall accompany the bid submission to DFCM. THIS BID BOND MUST BE ON THE DFCM BID BOND FORM PROVIDED WITH THIS INSTRUCTION TO BIDDERS IN ORDER TO BE CONSIDERED AN ACCEPTABLE BID unless only one bid is received by DFCM, or the failure to comply with the bid bond requirements is determined by the Director of DFCM to be nonsubstantial based on the following:

(a) the bid bond is submitted on a form other than DFCM's required Bid Bond form and the bid bond meets all other requirements including being issued by a surety firm authorized to do business in the State of Utah and be listed in the U.S. Department of the Treasury Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies for an amount not less than the amount of the bond to be issued. A co-surety may be utilized to satisfy this requirement; and

(b) the contractor provides a bid bond properly signed by a qualified surety and on the required DFCM Bid Bond form by the close of business of the next succeeding business day after the DFCM notifies the bidder of the defective bid bond.

10. Listing of Subcontractors

Listing of Subcontractors shall be as summarized in the "Instructions and Subcontractor's List Form", included as part of the contract documents. The subcontractors list shall be delivered to DFCM or faxed to DFCM at (801) 538-3677 within 24 hours of the bid opening. Requirements for listing additional subcontractors will be listed in the contract documents.

DFCM retains the right to audit or take other steps necessary to confirm compliance with requirements for the listing and changing of subcontractors. Any contractor who is found to not be in compliance with these requirements may be suspended from DFCM's list of pre-qualified contractors.

11. Contract and Bond

The Contractor's Agreement will be in the form provided in this document. The duration of the contract shall be for the time indicated by the project completion deadline shown on the schedule. The successful bidder, simultaneously with the execution of the Contractor's Agreement, will be required to furnish a performance bond and a payment bond, both bearing original signatures, upon the forms provided in the procurement documents.

The performance and payment bonds shall be for an amount equal to one hundred percent (100%) of the Contract Sum and secured from a company that meets the requirements specified in the requisite forms. Any bonding requirements for Subcontractors will be specified in the Supplementary General Conditions.

12. Award of Contract

The Contract will be awarded as soon as possible to the lowest, responsive and responsible bidder, based on the lowest combination of base bid and acceptable prioritized alternates, provided the bid is reasonable, is in the interests of DFCM to accept and after applying the Utah Preference Laws in U.C.A. Title 63, Chapter 56. DFCM reserves the right to waive any technicalities or formalities in any bid or in the bidding. Alternates will be accepted on a prioritized basis with Alternate 1 being highest priority, Alternate 2 having second priority, etc. Alternates will be selected in prioritized order up to the construction cost estimate.

13. Right to Reject Bids

DFCM reserves the right to reject any or all Bids.

14. Withdrawal of Bids

Bids may be withdrawn on written request received from bidders within 24 hours after the bid opening if the contractor has made an error in preparing the bid.

15. DFCM Contractor Performance Rating

As a contractor completes each project, DFCM will evaluate project performance based on the enclosed "DFCM Contractor Performance Rating" form. The ratings issued on this project may affect the firm's "pre-qualified" status and their ability to obtain future work with DFCM.

Stage II
PROJECT SCHEDULE

PROJECT NAME: **ELEVATOR MODERNIZATION - OGDEN REGIONAL CENTER**
DIVISION OF FACILITIES CONSTRUCTION & MANAGEMENT – OGDEN, UTAH
DFCM PROJECT #: **09071310**

Event	Day	Date	Time	Place
Stage II Bidding Documents Available	Monday	September 28, 2009	12:00 NOON	DFCM 4110 State Office Building SLC, UT and the DFCM web site*
Mandatory Pre-bid Site Meeting	Wednesday	October 7, 2009	1:00 PM	1st Floor Conference Room Ogden Regional Center 2540 Washington Blvd Ogden, UT
Deadline for Submitting Questions	Tuesday	October 13, 2009	4:00 PM	Bob Anderson – DFCM E-mail bobanderson@utah.gov Fax 801-538-3267
Addendum Deadline (exception for bid delays)	Thursday	October 15, 2009	12:00 NOON	DFCM web site*
Prime Contractors Turn in Bid and Bid Bond	Tuesday	October 20, 2009	3:00 PM	DFCM 4110 State Office Building SLC, UT
Subcontractors List Due	Wednesday	October 21, 2009	3:00 PM	DFCM 4110 State Office Building SLC, UT Fax 801-538-3677
Substantial Completion Date	Thursday	November 4, 2010	4:00 PM	

* **NOTE: DFCM's web site address is http://dfcm.utah.gov**

BID FORM

NAME OF BIDDER _____ DATE _____

To the Division of Facilities Construction and Management
4110 State Office Building
Salt Lake City, Utah 84114

The undersigned, responsive to the "Invitation to Bid" and in accordance with the Request for Bids for the **ELEVATOR MODERNIZATION - OGDEN REGIONAL CENTER - DIVISION OF FACILTIIES CONSTRUCTION AND MANAGEMENT – OGDEN, UTAH - DFCM PROJECT NO. 09071310** and having examined the Contract Documents and the site of the proposed Work and being familiar with all of the conditions surrounding the construction of the proposed Project, including the availability of labor, hereby proposes to furnish all labor, materials and supplies as required for the Work in accordance with the Contract Documents as specified and within the time set forth and at the price stated below. This price is to cover all expenses incurred in performing the Work required under the Contract Documents of which this bid is a part:

I/We acknowledge receipt of the following Addenda: _____

For all work shown on the Drawings and described in the Specifications and Contract Documents, I/we agree to perform for the sum of:

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

I/We guarantee that the Work will be Substantially Complete by **November 4, 2010**, should I/we be the successful bidder, and agree to pay liquidated damages in the amount of **$200.00** per day for each day after expiration of the Contract Time as stated in Article 3 of the Contractor's Agreement.

This bid shall be good for 45 days after bid opening.

Enclosed is a 5% bid bond, as required, in the sum of _____

The undersigned Contractor's License Number for Utah is _____.

Upon receipt of notice of award of this bid, the undersigned agrees to execute the contract within ten (10) days, unless a shorter time is specified in Contract Documents, and deliver acceptable Performance and Payment bonds in the prescribed form in the amount of 100% of the Contract Sum for faithful performance of the contract. The Bid Bond attached, in the amount not less than five percent (5%) of the above bid sum, shall become the property of the Division of Facilities Construction and Management as liquidated damages for delay and additional expense caused thereby in the event that the contract is not executed and/or acceptable l00% Performance and Payment bonds are not delivered within time set forth.

Type of Organization: _____
(Corporation, Partnership, Individual, etc.)

Any request and information related to Utah Preference Laws:

_____

Respectfully submitted,

_____
Name of Bidder

ADDRESS:

_____

_____

_____
Authorized Signature

BID BOND

(Title 63, Chapter 56, U. C. A. l953, as Amended)

KNOW ALL PERSONS BY THESE PRESENTS:

That _____ hereinafter referred to as the "Principal," and _____, a corporation organized and existing under the laws of the State of _____, with its principal office in the City of _____ and authorized to transact business in this State and U. S. Department of the Treasury Listed, (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); hereinafter referred to as the "Surety," are held and firmly bound unto the STATE OF UTAH, hereinafter referred to as the "Obligee," in the amount of $_____ (5% of the accompanying bid), being the sum of this Bond to which payment the Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has submitted to Obligee the accompanying bid incorporated by reference herein, dated as shown, to enter into a contract in writing for the _____ _____ Project.

NOW, THEREFORE, THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that if the said principal does not execute a contract and give bond to be approved by the Obligee for the faithful performance thereof within ten (10) days after being notified in writing of such contract to the principal, then the sum of the amount stated above will be forfeited to the State of Utah as liquidated damages and not as a penalty; if the said principal shall execute a contract and give bond to be approved by the Obligee for the faithful performance thereof within ten (10) days after being notified in writing of such contract to the Principal, then this obligation shall be null and void. It is expressly understood and agreed that the liability of the Surety for any and all defaults of the Principal hereunder shall be the full penal sum of this Bond. The Surety, for value received, hereby stipulates and agrees that obligations of the Surety under this Bond shall be for a term of sixty (60) days from actual date of the bid opening.

PROVIDED, HOWEVER, that this Bond is executed pursuant to provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their several seals on the date indicated below, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

DATED this _____ day of _____, 20_____ .

Principal's name and address (if other than a corporation):

_____

_____

By: _____

Title: _____

Principal's name and address (if a corporation):

_____

_____

By: _____

Title: _____

(Affix Corporate Seal)

Surety's name and address:

_____

_____

By: _____

Attorney-in-Fact (Affix Corporate Seal)

STATE OF _____)
) ss.
COUNTY OF _____)

On this ____ day of _____, 20____, personally appeared before me _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney-in-fact of the above-named Surety Company, and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20_____.
My Commission Expires: _____
Resides at: _____

_____
NOTARY PUBLIC

Agency: _____
Agent: _____
Address: _____
Phone: _____

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

INSTRUCTION AND SUBCONTRACTORS LIST FORM

The three low bidders, as well as all other bidders that desire to be considered, are required by law to submit to DFCM within 24 hours of bid opening a list of **ALL** first-tier subcontractors, including the subcontractor's name, bid amount and other information required by Building Board Rule and as stated in these Contract Documents, based on the following:

DOLLAR AMOUNTS FOR LISTING

PROJECTS UNDER $500,000: ALL FIRST-TIER SUBS $20,000 OR OVER MUST BE LISTED
PROJECTS $500,000 OR MORE: ALL FIRST-TIER SUBS $35,000 OR OVER MUST BE LISTED

- Any additional subcontractors identified in the bid documents shall also be listed.
- The DFCM Director may not consider any bid submitted by a bidder if the bidder fails to submit a subcontractor list meeting the requirements of State law.
- List subcontractors for base bid as well as the impact on the list that the selection of any alternate may have.
- Bidder may not list more than one subcontractor to perform the same work.
- If there are no subcontractors for the job that are required to be reported by State law (either because there are no subcontractors that will be used on the project or because there are no first-tier subcontractors over the dollar amounts referred to above), then you do not need to submit a sublist. If you do not submit a sublist, it will be deemed to be a representation by you that there are no subcontractors on the job that are required to be reported under State law. At any time, DFCM reserves the right to inquire, for security purposes, as to the identification of the subcontractors at any tier that will be on the worksite.

LICENSURE:

The subcontractor's name, the type of work, the subcontractor's bid amount, and the subcontractor's license number as issued by DOPL, if such license is required under Utah Law, shall be listed. Bidder shall certify that all subcontractors, required to be licensed, are licensed as required by State law. A subcontractor includes a trade contractor or specialty contractor and does not include suppliers who provide only materials, equipment, or supplies to a contractor or subcontractor.

'SPECIAL EXCEPTION':

A bidder may list 'Special Exception' in place of a subcontractor when the bidder intends to obtain a subcontractor to perform the work at a later date because the bidder was unable to obtain a qualified or reasonable bid under the provisions of U.C.A.Section 63A-5-208(4). The bidder shall insert the term 'Special Exception' for that category of work, and shall provide documentation with the subcontractor list describing the bidder's efforts to obtain a bid of a qualified subcontractor at a reasonable cost and why the bidder was unable to obtain a qualified subcontractor bid. The Director must find that the bidder complied in good faith with State law requirements for any 'Special Exception' designation, in order for the bid to be considered. If awarded the contract, the Director shall supervise the bidder's efforts to obtain a qualified subcontractor bid. The amount of the awarded contract may not be adjusted to reflect the actual amount of the subcontractor's bid. Any listing of 'Special Exception' on the sublist form shall also include amount allocated for that work.

GROUNDS FOR DISQUALIFICATION:

The Director may not consider any bid submitted by a bidder if the bidder fails to submit a subcontractor list meeting the requirements of State law. Director may withhold awarding the contract to a particular bidder if one or more of the proposed subcontractors are considered by the Director to be unqualified to do the Work or for such

other reason in the best interest of the State of Utah. Notwithstanding any other provision in these instructions, if there is a good faith error on the sublist form, at the sole discretion of the Director, the Director may provide notice to the contractor and the contractor shall have 24 hours to submit the correction to the Director. If such correction is submitted timely, then the sublist requirements shall be considered met.

CHANGES OF SUBCONTRACTORS SPECIFICALLY IDENTIFIED ON SUBLIST FORM:

Subsequent to twenty-four hours after the bid opening, the contractor may change its listed subcontractors only after receiving written permission from the Director based on complying with all of the following criteria.

(1) The contractor has established in writing that the change is in the best interest of the State and that the contractor establishes an appropriate reason for the change, which may include, but not is not limited to, the following reasons: the original subcontractor has failed to perform, or is not qualified or capable of performing, and/or the subcontractor has requested in writing to be released.
(2) The circumstances related to the request for the change do not indicate any bad faith in the original listing of the subcontractors.
(3) Any requirement set forth by the Director to ensure that the process used to select a new subcontractor does not give rise to bid shopping.
(4) Any increase in the cost of the subject subcontractor work is borne by the contractor.
(5) Any decrease in the cost of the subject subcontractor work shall result in a deductive change order being issued for the contract for such decreased amount.
(6) The Director will give substantial weight to whether the subcontractor has consented in writing to being removed unless the Contractor establishes that the subcontractor is not qualified for the work.

EXAMPLE:

Example of a list where there are only four subcontractors:

TYPE OF WORK	SUBCONTRACTOR, "SELF" OR "SPECIAL EXCEPTION"	SUBCONTRACTOR BID AMOUNT	CONTRACTOR LICENSE #
ELECTRICAL	ABCD Electric Inc.	$350,000.00	123456789000
LANDSCAPING	"Self" *	$300,000.00	123456789000
CONCRETE (ALTERNATE #1)	XYZ Concrete Inc	$298,000.00	987654321000
MECHANICAL	"Special Exception" (attach documentation)	Fixed at: $350,000.00	(TO BE PROVIDED AFTER OBTAINING SUBCONTRACTOR)

* Bidders may list "self", but it is not required.

PURSUANT TO STATE LAW - SUBCONTRACTOR BID AMOUNTS CONTAINED IN THIS SUBCONTRACTOR LIST SHALL NOT BE DISCLOSED UNTIL THE CONTRACT HAS BEEN AWARDED.

SUBCONTRACTORS LIST
FAX TO 801-538-3677

PROJECT TITLE: _____

Caution: You must read and comply fully with instructions.

TYPE OF WORK	SUBCONTRACTOR, "SELF" OR "SPECIAL EXCEPTION"	SUBCONTRACTOR BID AMOUNT	CONT. LICENSE #

We certify that:

l. This list includes all subcontractors as required by the instructions, including those related to the base bid as well as any alternates.
2. We have listed "Self" or "Special Exception" in accordance with the instructions.
3. All subcontractors are appropriately licensed as required by State law.

FIRM: _____

DATE: _____ SIGNED BY: _____

NOTICE: FAILURE TO SUBMIT THIS FORM, PROPERLY COMPLETED AND SIGNED, AS REQUIRED IN THESE CONTRACT DOCUMENTS, SHALL BE GROUNDS FOR OWNER'S REFUSAL TO ENTER INTO A WRITTEN CONTRACT WITH BIDDER. ACTION MAY BE TAKEN AGAINST BIDDERS BID BOND AS DEEMED APPROPRIATE BY OWNER. ATTACH A SECOND PAGE IF NECESSARY.

CONTRACTOR'S AGREEMENT

FOR:

_____
_____
_____

THIS CONTRACTOR'S AGREEMENT, made and entered into this ____ day of _____, 20__, by and between the DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT, hereinafter referred to as "DFCM", and _____, incorporated in the State of _____ and authorized to do business in the State of Utah, hereinafter referred to as "Contractor", whose address is _____.

WITNESSETH: WHEREAS, DFCM intends to have Work performed at _____ _____.

WHEREAS, Contractor agrees to perform the Work for the sum stated herein.

NOW, THEREFORE, DFCM and Contractor for the consideration provided in this Contractor's Agreement, agree as follows:

ARTICLE 1. SCOPE OF WORK. The Work to be performed shall be in accordance with the Contract Documents prepared by _____ and entitled "_____."

The DFCM General Conditions ("General Conditions") dated May 25, 2005 and Supplemental General Conditions dated July 15, 2008 and July 1, 2009 ("also referred to as General Conditions") and on file at the office of DFCM and available on the DFCM website, are hereby incorporated by reference as part of this Agreement and are included in the specifications for this Project. All terms used in this Contractor's Agreement shall be as defined in the Contract Documents, and in particular, the General Conditions.

The Contractor Agrees to furnish labor, materials and equipment to complete the Work as required in the Contract Documents which are hereby incorporated by reference. It is understood and agreed by the parties hereto that all Work shall be performed as required in the Contract Documents and shall be subject to inspection and approval of DFCM or its authorized representative. The relationship of the Contractor to the DFCM hereunder is that of an independent Contractor.

ARTICLE 2. CONTRACT SUM. The DFCM agrees to pay and the Contractor agrees to accept in full performance of this Contractor's Agreement, the sum of _____ _____ DOLLARS AND NO CENTS ($_____.00), which

is the base bid, and which sum also includes the cost of a 100% Performance Bond and a 100% Payment Bond as well as all insurance requirements of the Contractor. Said bonds have already been posted by the Contractor pursuant to State law. The required proof of insurance certificates have been delivered to DFCM in accordance with the General Conditions before the execution of this Contractor's Agreement.

ARTICLE 3. TIME OF COMPLETION AND DELAY REMEDY. The Work shall be Substantially Complete by _____. Contractor agrees to pay liquidated damages in the amount of $_____ per day for each day after expiration of the Contract Time until the Contractor achieves Substantial Completion in accordance with the Contract Documents, if Contractor's delay makes the damages applicable. The provision for liquidated damages is: (a) to compensate the DFCM for delay only; (b) is provided for herein because actual damages can not be readily ascertained at the time of execution of this Contractor's Agreement; (c) is not a penalty; and (d) shall not prevent the DFCM from maintaining Claims for other non-delay damages, such as costs to complete or remedy defective Work.

No action shall be maintained by the Contractor, including its or Subcontractor or suppliers at any tier, against the DFCM or State of Utah for damages or other claims due to losses attributable to hindrances or delays from any cause whatsoever, including acts and omissions of the DFCM or its officers, employees or agents, except as expressly provided in the General Conditions. The Contractor may receive a written extension of time, signed by the DFCM, in which to complete the Work under this Contractor's Agreement in accordance with the General Conditions.

ARTICLE 4. CONTRACT DOCUMENTS. The Contract Documents consist of this Contractor's Agreement, the Conditions of the Contract (DFCM General Conditions, Supplementary and other Conditions), the Drawings, Specifications, Addenda and Modifications. The Contract Documents shall also include the bidding documents, including the Notice to Contractors, Instructions to Bidders/Proposers and the Bid/Proposal, to the extent not in conflict therewith and other documents and oral presentations that are documented as an attachment to the contract.

All such documents are hereby incorporated by reference herein. Any reference in this Contractor's Agreement to certain provisions of the Contract Documents shall in no way be construed as to lessen the importance or applicability of any other provisions of the Contract Documents.

ARTICLE 5. PAYMENT. The DFCM agrees to pay the Contractor from time to time as the Work progresses, but not more than once each month after the date of Notice to Proceed, and only upon Certificate of the A/E for Work performed during the preceding calendar month, ninety-five percent (95%) of the value of the labor performed and ninety-five percent (95%) of the value of materials furnished in place or on the site. The Contractor agrees to furnish to the DFCM invoices for materials purchased and on the site but not installed, for which the Contractor requests payment and agrees to safeguard and protect such equipment or materials and is responsible for safekeeping thereof and if such be stolen, lost or destroyed, to replace same.

Such evidence of labor performed and materials furnished as the DFCM may reasonably require shall be supplied by the Contractor at the time of request for Certificate of Payment on account. Materials for which payment has been made cannot be removed from the job site without DFCM's written approval. Five percent (5%) of the earned amount shall be retained from each monthly payment. The retainage, including any additional retainage imposed and the release of any retainage, shall be in accordance with UCA 13-8-5 as amended. Contractor shall also comply with the requirements of UCA 13-8-5, including restrictions of retainage regarding subcontractors and the distribution of interest earned on the retention proceeds. The DFCM shall not be responsible for enforcing the Contractor's obligations under State law in fulfilling the retention law requirements with subcontractors at any tier.

ARTICLE 6. INDEBTEDNESS. Before final payment is made, the Contractor must submit evidence satisfactory to the DFCM that all payrolls, materials bills, subcontracts at any tier and outstanding indebtedness in connection with the Work have been properly paid. Final Payment will be made after receipt of said evidence, final acceptance of the Work by the DFCM as well as compliance with the applicable provisions of the General Conditions.

Contractor shall respond immediately to any inquiry in writing by DFCM as to any concern of financial responsibility and DFCM reserves the right to request any waivers, releases or bonds from Contractor in regard to any rights of Subcontractors (including suppliers) at any tier or any third parties prior to any payment by DFCM to Contractor.

ARTICLE 7. ADDITIONAL WORK. It is understood and agreed by the parties hereto that no money will be paid to the Contractor for additional labor or materials furnished unless a new contract in writing or a Modification hereof in accordance with the General Conditions and the Contract Documents for such additional labor or materials has been executed. The DFCM specifically reserves the right to modify or amend this Contractor's Agreement and the total sum due hereunder either by enlarging or restricting the scope of the Work.

ARTICLE 8. INSPECTIONS. The Work shall be inspected for acceptance in accordance with the General Conditions.

ARTICLE 9. DISPUTES. Any dispute, PRE or Claim between the parties shall be subject to the provisions of Article 7 of the General Conditions. DFCM reserves all rights to pursue its rights and remedies as provided in the General Conditions.

ARTICLE 10. TERMINATION, SUSPENSION OR ABANDONMENT. This Contractor's Agreement may be terminated, suspended or abandoned in accordance with the General Conditions.

ARTICLE 11. DFCM'S RIGHT TO WITHHOLD CERTAIN AMOUNT AND MAKE USE THEREOF. The DFCM may withhold from payment to the Contractor such amount as, in DFCM's judgment, may be necessary to pay just claims against the Contractor or Subcontractor at any tier for labor and services rendered and materials furnished in and about the Work. The DFCM may apply such withheld amounts for the payment of such claims in DFCM's discretion. In so doing, the DFCM shall be deemed the agent of Contractor and payment so made by the DFCM shall be considered as payment made under this Contractor's Agreement by the DFCM to the Contractor. DFCM shall not be liable to the Contractor for any such payment made in good faith. Such withholdings and payments may be made without prior approval of the Contractor and may be also be prior to any determination as a result of any dispute, PRE, Claim or litigation.

ARTICLE 12. INDEMNIFICATION. The Contractor shall comply with the indemnification provisions of the General Conditions.

ARTICLE 13. SUCCESSORS AND ASSIGNMENT OF CONTRACT. The DFCM and Contractor, respectively bind themselves, their partners, successors, assigns and legal representatives to the other party to this Agreement, and to partners, successors, assigns and legal representatives of such other party with respect to all covenants, provisions, rights and responsibilities of this Contractor's Agreement. The Contractor shall not assign this Contractor's Agreement without the prior written consent of the DFCM, nor shall the Contractor assign any moneys due or to become due as well as any rights under this Contractor's Agreement, without prior written consent of the DFCM.

ARTICLE 14. RELATIONSHIP OF THE PARTIES. The Contractor accepts the relationship of trust and confidence established by this Contractor's Agreement and covenants with the DFCM to cooperate with the DFCM and A/E and use the Contractor's best skill, efforts and judgment in furthering the interest of the DFCM; to furnish efficient business administration and supervision; to make best efforts to furnish at all times an adequate supply of workers and materials; and to perform the Work in the best and most expeditious and economic manner consistent with the interests of the DFCM.

ARTICLE 15. AUTHORITY TO EXECUTE AND PERFORM AGREEMENT. Contractor and DFCM each represent that the execution of this Contractor's Agreement and the performance thereunder is within their respective duly authorized powers.

ARTICLE 16. ATTORNEY FEES AND COSTS. Except as otherwise provided in the dispute resolution provisions of the General Conditions, the prevailing party shall be entitled to reasonable attorney fees and costs incurred in any action in the District Court and/or appellate body to enforce this Contractor's Agreement or recover damages or any other action as a result of a breach thereof.

IN WITNESS WHEREOF, the parties hereto have executed this Contractor's Agreement on the day and year stated hereinabove.

CONTRACTOR: _____

_____
Signature Date

Title: _____

State of _____)
)
County of _____) _____
Please type/print name clearly

On this ____ day of _____, 20____, personally appeared before me, _____, whose identity is personally known to me (or proved to me on the basis of satisfactory evidence) and who by me duly sworn (or affirmed), did say that he (she) is the _____ (title or office) of the firm and that said document was signed by him (her) in behalf of said firm.

_____
Notary Public

(SEAL)

My Commission Expires _____

APPROVED AS TO AVAILABILITY OF FUNDS:

_____
David D. Williams, Jr. Date
DFCM Administrative Services Director

DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT

_____
Lynn A. Hinrichs Date
Assistant Director Construction Management

APPROVED AS TO FORM:
ATTORNEY GENERAL
July 1, 2009
By: Alan S. Bachman
Asst Attorney General

APPROVED FOR EXPENDITURE:

_____
Division of Finance Date

PERFORMANCE BOND

(Title 63, Chapter 56, U. C. A. 1953, as Amended)

That _____ hereinafter referred to as the "Principal" and _____, a corporation organized and existing under the laws of the State of _____, with its principal office in the City of _____ and authorized to transact business in this State and U. S. Department of the Treasury Listed (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); hereinafter referred to as the "Surety," are held and firmly bound unto the State of Utah, hereinafter referred to as the "Obligee, " in the amount of _____ _____ DOLLARS ($_____) for the payment whereof, the said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Contract with the Obligee, dated the _____ day of _____, 20____, to construct _____ in the County of _____, State of Utah, Project No. _____, for the approximate sum of _____ _____ Dollars ($_____), which Contract is hereby incorporated by reference herein.

NOW, THEREFORE, the condition of this obligation is such that if the said Principal shall faithfully perform the Contract in accordance with the Contract Documents including, but not limited to, the Plans, Specifications and conditions thereof, the one year performance warranty, and the terms of the Contract as said Contract may be subject to Modifications or changes, then this obligation shall be void; otherwise it shall remain in full force and effect.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the state named herein or the heirs, executors, administrators or successors of the Owner.

The parties agree that the dispute provisions provided in the Contract Documents apply and shall constitute the sole dispute procedures of the parties.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the Provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20_____.

WITNESS OR ATTESTATION:

_____

PRINCIPAL:

_____

By: _____

(Seal)

Title: _____

WITNESS OR ATTESTATION:

_____

SURETY:

_____

By: _____

Attorney-in-Fact (Seal)

STATE OF _____)

) ss.

COUNTY OF _____)

On this _____ day of _____, 20____, personally appeared before me _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney in-fact of the above-named Surety Company and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20_____.

My commission expires: _____

Resides at: _____

_____

NOTARY PUBLIC

Agency: _____
Agent: _____
Address: _____
Phone: _____

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

PAYMENT BOND

(Title 63, Chapter 56, U. C. A. l953, as Amended)

KNOW ALL PERSONS BY THESE PRESENTS:

That _____ hereinafter referred to as the "Principal," and _____ _____, a corporation organized and existing under the laws of the State of _____authorized to do business in this State and U. S. Department of the Treasury Listed (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); with its principal office in the City of _____, hereinafter referred to as the "Surety," are held and firmly bound unto the State of Utah hereinafter referred to as the "Obligee," in the amount of _____ Dollars ($_____) for the payment whereof, the said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Contract with the Obligee, dated the _____ day of _____, 20____, to construct _____ in the County of _____, State of Utah, Project No. _____ for the approximate sum of _____ _____ Dollars ($_____), which contract is hereby incorporated by reference herein.

NOW, THEREFORE, the condition of this obligation is such that if the said Principal shall pay all claimants supplying labor or materials to Principal or Principal's Subcontractors in compliance with the provisions of Title 63, Chapter 56, of Utah Code Annotated, l953, as amended, and in the prosecution of the Work provided for in said Contract, then, this obligation shall be void; otherwise it shall remain in full force and effect.

That said Surety to this Bond, for value received, hereby stipulates and agrees that no changes, extensions of time, alterations or additions to the terms of the Contract or to the Work to be performed thereunder, or the specifications or drawings accompanying same shall in any way affect its obligation on this Bond, and does hereby waive notice of any such changes, extensions of time, alterations or additions to the terms of the Contract or to the Work or to the specifications or drawings and agrees that they shall become part of the Contract Documents.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20____.

WITNESS OR ATTESTATION:

_____

PRINCIPAL:

_____

By: _____

(Seal)

Title: _____

WITNESS OR ATTESTATION:

_____

SURETY:

_____

By: _____

Attorney-in-Fact (Seal)

STATE OF _____)
) ss.
COUNTY OF _____)

On this _____ day of _____, 20_____, personally appeared before me _____ _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney-in-fact of the above-named Surety Company, and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20_____.

My commission expires: _____

Resides at: _____

_____

NOTARY PUBLIC

Agency: _____
Agent: _____
Address: _____
Phone: _____

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

Division of Facilities Construction and Management

DFCM

CERTIFICATE OF SUBSTANTIAL COMPLETION

PROJECT _____ PROJECT NO: _____

AGENCY/INSTITUTION _____

AREA ACCEPTED _____

The Work performed under the subject Contract has been reviewed on this date and found to be Substantially Completed as defined in the General Conditions; including that the construction is sufficiently completed in accordance with the Contract Documents, as modified by any change orders agreed to by the parties, so that the State of Utah can occupy the Project or specified area of the Project for the use for which it is intended.

The DFCM - (Owner) accepts the Project or specified area of the Project as Substantially Complete and will assume full possession of the Project or specified area of the Project at _____ (time) on _____ (date).

The DFCM accepts the Project for occupancy and agrees to assume full responsibility for maintenance and operation, including utilities and insurance, of the Project subject to the itemized responsibilities and/or exceptions noted below:

_____

_____

The Owner acknowledges receipt of the following closeout and transition materials:

Record Drawings O & M Manuals Warranty Documents Completion of Training Requirements

A list of items to be completed or corrected (Punch List) is attached hereto. The failure to include an item on it does not alter the responsibility of the Contractor to complete all the Work in accordance with the Contract Documents, including authorized changes thereof. The amount of_____. (Twice the value of the punch list work) shall be retained to assure the completion of the punch list work.

The Contractor shall complete or correct the Work on the list of (Punch List) items appended hereto within _____ ____calendar days from the above date of issuance of this Certificate. If the list of items is not completed within the time allotted the Owner has the right to be compensated for the delays and/or complete the work with the help of independent contractor at the expense of the retained project funds. If the retained project funds are insufficient to cover the delay/completion damages, the Owner shall be promptly reimbursed for the balance of the funds needed to compensate the Owner.

_____ by: _____

CONTRACTOR (include name of firm) (Signature) DATE

_____ by: _____

A/E (include name of firm) (Signature) DATE

_____ by: _____

USING INSTITUTION OR AGENCY (Signature) DATE

_____ by: _____

DFCM (Owner) (Signature) DATE

4110 State Office Building, Salt Lake City, Utah 84114
telephone 801-538-3018 • facsimile 801-538-3267 • http://dfcm.utah.gov

cc: Parties Noted
DFCM, Director

STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

Division of Facilities Construction and Management

DFCM

General Contractor Performance Rating Form

Project Name:		DFCM Project#	
Contractor: (ABC Construction, John Doe, 111-111-1111)	A/E: (ABC Architects, Jane Doe, 222-222-2222)	Original Contract Amount:	Final Contract Amount:
DFCM Project Manager:		Contract Date:	
Completion Date:		Date of Rating:	

Rating Guideline	QUALITY OF PRODUCT OR SERVICES	COST CONTROL	TIMELINESS OF PERFORMANCE	BUSINESS RELATIONS
5-Exceptional	Contractor has demonstrated an exceptional performance level in any of the above four categories that justifies adding a point to the score. Contractor performance clearly exceeds the performance levels described as "Very Good"			
4-Very Good	Contractor is in compliance with contract requirements and/or delivers quality product/service.	Contractor is effective in managing costs and submits current, accurate, and complete billings	Contractor is effective in meeting milestones and delivery schedule	Response to inquiries, technical/service/ administrative issues is effective
3-Satisfactory	Minor inefficiencies/errors have been identified	Contractor is usually effective in managing cost	Contractor is usually effective in meeting milestones and delivery schedules	Response to inquires technical/ service/administrative issues is somewhat effective
2-Marginal	Major problems have been encountered	Contractor is having major difficulty managing cost effectively	Contractor is having major difficulty meeting milestones and delivery schedule	Response to inquiries, technical/service/administrative issues is marginally effective
1-Unsatisfactory	Contractor is not in compliance and is jeopardizing achievement of contract objectives	Contractor is unable to manage costs effectively	Contractor delays are jeopardizing performance of contract objectives	Response to inquiries, technical/service/administrative issues is not effective

1. Rate Contractors quality of workmanship, management of sub contractor performance, project cleanliness, organization and safety requirement.	Score
Agency Comments:	
A & E Comments:	
DFCM Project Manager Comments:	

2. Rate Contractor administration of project costs, change orders and financial management of the project budget.	**Score**
Agency Comments:	
A & E Comments:	
DFCM Project Manager Comments:	

3. Rate Contractor's performance and adherence to Project Schedule, delay procedures and requirements of substantial completion, inspection and punch-list performance.	**Score**
Agency Comments:	
A & E Comments:	
DFCM Project Manager Comments:	

4. Evaluate performance of contractor management team including project manager, engineer and superintendent also include in the rating team's ability to work well with owner, user agency and consultants.	**Score**
Agency Comments:	
A & E Comments:	
DFCM Project Manager Comments:	

5. Rate success of Contractor's management plan, completion of the plans mitigation of project risks and performance of value engineering concepts.	Score
Agency Comments:	
A & E Comments:	
DFCM Project Manager Comments:	

Signed by:	Date:	Mean Score

Additional Comments:

OGDEN REGIONAL CENTER

ELEVATOR MODERNIZATION

2540 Washington Blvd
Ogden, Utah 84401

STATE OF UTAH

DEPARTMENT OF ADMINISTRATIVE SERVICES

DIVISION OF FACILITIES CONSTRUCTION

AND MANAGEMENT

DFCM PROJECT #09071310

DFCM CONTRACT #0974998

PROJECT MANUAL & SPECIFICATIONS

CONSTRUCTION SET

14 SEPTEMBER 2009

JSA ARCHITECTS
6465 South 3000 East, Suite #205
Salt Lake City, Utah 84121
801-733-2500

PROJECT MANUAL 14 September 2009

Cover Page

AGREEMENTS:		Pages
ELEVATOR MAINTENANCE SERVICE AGREEMENT		1 – 5
ATTACHMENT A –	STANDARD TERMS & CONDITIONS	(By reference)
ATTACHMEMT B –	SPECIFICATIONS FOR ELEVATOR SERVICE CONTRACT AGREEMENT	1 - 6

SPECIFICATIONS:	Pages
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DIVISION 0 – BIDDING AND CONTRACT REQUIREMENTS

Bidding, contract and construction administration forms are provided by Division of Facilities Construction and Management (DFCM). Those to be found include but are not limited to:

– INVITATION TO PRE-BID MEETING
– BID FORM (DISTRIBUTED AT PRE-BID MEETING)
– BID BOND
– SUBCONTRACTOR LIST FORM WITH INSTRUCTIONS
– CONTRACTOR'S AGREEMENT
– PERFORMANCE BOND
– PAYMENT BOND
– CONTRACTOR'S COMMITMENT TO INSURANCE
– APPLICATION AND CERTIFICATE FOR PAYMENT
– CONTRACTOR'S AFFIDAVIT OF PAYMENT
– CONTRACTOR'S COMMITMENT TO DISTRIB INTEREST ON RETENTION
– CONSENT OF SURETY TO FINAL PAYMENT
– GENERAL CONDITIONS
– REQUIRED CONTRACT CLAUSES
– SUPPLEMENTAL CONDITIONS FOR CONSTRUCTION AGREEMENTS
– SUPPLEMENTAL CONDITIONS FOR HEALTH INSURANCE
--SUPPLEMENTAL CONDITIONS FOR ILLEGAL IMMIGRATION
-- MEETING ATTENDANCE LOG
-- CONSTRUCTION PROGRESS MEETING MINUTES
-- REQUEST FOR INFORMATION
-- PROPOSAL REQUEST
-- CONSTRUCTION CHANGE DIRECTIVE
-- CHANGE ORDER
-- CERTIFICATE OF SUBSTANTIAL COMPLETION

DIVISION 01 – GENERAL REQUIREMENTS	Pages
011000 – SUMMARY	1 - 3
012600 - CONTRACT MODIFICATION PROCEDURES	1 - 2
013200 – CONSTRUCTION PROGRESS MODIFICATIONS	1 - 4
013300 – SUBMITTAL PROCEDURES	1 - 8
015000 - TEMPORARY FACILITIES AND CONTROLS	1 - 5

017700 – CLOSEOUT PROCEDURES 1 - 5
017823 – OPERATION AND MAINTENANCE DATA 1 - 4
017839 – PROJECT RECORD DOCUMENTS 1 - 3

DIVISION 02 – EXISTING CONDITIONS
024119 – SELECTIVE DEMOLITION AND SALVAGE 1 - 4

DIVISION 03 – CONCRETE No Work
DIVISION 04 - MASONRY No Work
DIVISION 05 - METALS No Work
DIVISION 06 - WOOD, PLASTICS AND COMPOSITES No Work
DIVISION 07 - THERMAL & MOISTURE PROTECTION No Work
DIVISION 08 - OPENINGS No Work
DIVISION 09 - FINISHES
095113 – ACOUSTICAL PANEL CEILINGS 1 - 3
096813 – TILE CARPETING 1 - 3
099123 – INTERIOR PAINTING 1 - 5

DIVISION 10 - SPECIALTIES
102600 - WALL PROTECTION 1 - 2

DIVISION 11 - EQUIPMENT No Work
DIVISION 12 - FURNISHINGS No Work
DIVISION 13 - SPECIAL CONSTRUCTION No Work
DIVISION 14 - CONVEYING EQUIPMENT
142100 – ELECTRIC TRACTION ELEVATORS 1 - 21
143250 -- ELEVATOR MAINTENANCE REQUIREMENTS 1 - 8

DIVISION 22 - PLUMBING No Work
DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING No Work

DIVISION 26 - ELECTRICAL
260500 COMMON WORK RESULTS FOR ELECTRICAL
260519 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
260526 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
260533 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS
260548 VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS
260553 IDENTIFICATION FOR ELECTRICAL SYSTEMS
260573 OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDY
262726 WIRING DEVICES
262813 FUSES
262816 ENCLOSED SWITCHES AND CIRCUIT BREAKERS
262913 ENCLOSED CONTROLLERS

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

281300 ACCESS CONTROL

DIVISION 31 - EARTHWORK No Work

DIVISION 32 - EXTERIOR IMPROVEMENTS No Work
DIVISION 33 - UTILITIES No Work

STATE OF UTAH
DEPARTMENT OF ADMINISTRATIVE SERVICES
DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT
ELEVATOR MAINTENANCE SERVICE
CONTRACT AGREEMENT
_____ BUILDING

Contract#_____

THIS AGREEMENT made and entered into between _____., whose address is _____, hereinafter referred to as "CONTRACTOR", and the STATE OF UTAH, DEPARTMENT OF ADMINSTRATIVE SERVICES, DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT hereinafter referred to as "DIVISION".

WHEREIN IT IS MUTUALLY AGREED AS FOLLOWS:

THIS AGREEMENT consists of this executed contract document with following exhibit(s) and attachment(s): Attachment A – Standard Terms and Conditions, and Attachment B – Specifications.

SPECIFICATIONS

THIS AGREEMENT shall commence on _____, and continue until _____. Either party may notify the other in writing at least sixty (60) days prior to the expiration date of their intent not to renew the contract.

WITNESSETH

That the Contractor and the Division, for consideration hereinafter name hereby covenants and agree to perform work, services, and standards as thus stated:

ARTICLE 1. DESIGNATED WORK

The intent of this contract is to place with the Contractor the full and complete responsibility for skilled elevator maintenance service to be performed on the following:

The _____ Elevator covered under this contract is located at _____ Building, located at _____

Please see Attachment B. Contractor will perform for the Division the items of work set out in separate Specifications collectively listed on Attachments attached hereto and made a part hereof.

ARTICE 2. CONTRACTUAL RELATIONSHIP

(a) The Contractor shall have full control and direction over the labor, mode and manner of doing the work according to the Contract and Specifications. All assigned work is to be done by the Contractor or the Contractor's employees and wholly at the risk of the Contractor. During its progress, the Contractor shall take all precautions for the safe performance of the work and the safety of the property and injury of persons present.

(b) The relationship which the Contractor shall bear to the Division under this agreement shall be that of an independent contractor for any and all purposed and nothing herein contained shall be construed to be inconsistent with this relationship status.

(c) In accordance with the Division's policy with respect to contractor relationship, it is hereby stipulated by the undersigned representative of the Contractor, that to the best of his knowledge and belief the contractor has not employed, retained, induced, or directed any person employed by the Division to solicit or secure this contract upon agreement, offer, understanding, or publication involving any form of remuneration whatsoever.

(d) The Contractor shall have none of the rights or privileges available to officer or employees of the State of Utah. Every workman assigned to perform any work relating to this contract shall be fully trained by the contractor prior to working on the premises. In-service training shall also be provided to sustain an acceptable performance level.

(e) The Division agrees not to actively solicit Contractor's employees or management personnel providing service to this said contractual unit, honoring a one (1) year time lapse before hiring the Contractor's employees, unless otherwise agreed to by the parties of this contract.

(f) In the event of a work stoppage by employees of the Division or the Contractor or any other of the Division's contractors affecting any of the locations covered herein, Contractor shall furnish service required to keep location in satisfactory condition. In the event of danger to Contractor's employees, this service shall be performed by Contractor's management personnel, in cooperation with Division authorities.

ARTICLE 3. PERMITS AND LICENSE – LIABILITY

(a) The Contractor shall secure and pay for all governmental permits and licenses required by law with relation to any work covered by this contract, and shall give all notices, pay all fees and comply with all laws, ordinances, rules, and regulations relating to the work specified.

(b) The Contractor shall provide a performance bond equal to 100% of the yearly contract which shall be in effect for the full period of the contract. Said bond shall guarantee that the contractor shall perform as agreed in the contract.

(c) The Contractor shall be liable for any and all personal injury and damage to the facilities, equipment and furnishings caused by his employees, whether such damage was accidental or intentional.

(d) The Contractor agrees that it/he shall at all times protect and indemnify and save harmless, the State of Utah and all institutions, agencies, departments, authorities and instrumentalities of the State of Utah and any of their elected or appointed officers or any of their employees from any and all claims, damages of every kind and nature made, rendered or incurred by or in behalf of any person or corporation whatsoever, including the parties hereto and their employees that may arise, occur or grow out of any acts, negligence, actions, work or other activity done by the said contractor in the performance and execution of this contract.

ARTICLE 4. INSURANCE

(a) The Contractor shall take out, pay for, and at all times during the performance of work hereunder, maintain, through companies or agencies approved by the Division of Facilities Construction and Management containing provisions satisfactory to the Division, such public, contingence and employer's liability compensation insurance and other employee benefit acts and from any and all claims for damage for personal injury, including death and from claims for property damage or loss thereof, which may arise in or result from the performance of the work covered by the Contractor or by failure or omission of the contractor to comply with any of the provisions of the contract. Such insurance shall include automobile, products-completed, operations and blanket broad form contractual, with coverage adequate in the amounts to be determined by the Contractor to be reasonably necessary to afford protection from such claims, but with minimum limits as to both bodily injury and property damage of not less than $1,000,000 each, which coverage shall be written on an occurrence basis.

(b) Certificates, indicating such insurance to be enforce and effect and providing that they will not be canceled during the performance of the work under the contract without thirty (30) days prior written notice to the Division, shall be filed with the Division prior to commencement of work hereunder; provided, however, that the Contractor shall at any time upon request, file duplicate copies of the policies of such insurance with the Division.

The following are the minimum liability limits:

General Liability	$1,000,000
Occurrence Liability	$1,000,000
Personal Injury	$1,000,000

ARTICLE 5. LABOR, EQUIPMENT, AND SUPPLIES

(a) The Contractor agrees to furnish all labor, materials and equipment to complete the work as required in the specifications which are hereby made a part of this contract by reference. It is understood and agreed by the parties hereto that all work shall be performed as required in the specifications and shall be subject to inspection and approval of the Division or its authorized representative. The relationship of the Contractor to the Division hereunder is that of an independent contractor.

(b) The Contractor may store his tools and equipment in an orderly manner on the Division's premises wholly at his own risk when designated space is available, except that gasoline using equipment shall not be stored inside a building.

ARTICLE 6. CANCELLATION, RENEWAL, CANCELLATION FOR CAUSE

(a) In the event the Contractor, through the result of workmanship or his organization, fails to perform the services agreed to under this contract, the Division of Facilities Construction and

Management may serve written notice upon the contractor of its intention to terminate said contract; and unless within ten (10) days after serving of such notice, such violations do not cease, the Division may terminate this contract for cause. The Division then may take over the work and prosecute the same to completion under the terms of the contract or by any other method it may deem advisable at the expense of the contractor. The contractor shall be liable to the Division for any expenses incurred in excess of the price specified herein in taking over this contract or hiring substitute elevator maintenance service.

(b) In event of excessively long delivery of minor parts – long delivery is defined as that time in excess of normal shipping and delivery time after minor parts could have been ordered via written correspondence. Thus, the non-stocking of minor parts is cause for cancellation. Written notice from owner to contractor shall be given sixty (60) days prior to cancellation.

(c) The Contractor reserves the right to cancel the contract at any time, by notification in writing, should payments not be made in accordance with the terms of the agreement.

(d) Contractor and Division both acknowledge that the Division cannot contract for payment of funds not yet appropriated by the Utah State Legislature. The Division, therefore, reserves the right for this reason to terminate the contract by giving sixty (60) days notices in the manner heretofore stated.

ARTICLE 7. INSPECTION OF WORK

Inspection of the whole, or any part of the work, and of the supplies and materials furnished by the Contractor, may be made by the Division's representative, or other so authorized individual, at any time.

The Contractor will provide weekly written inspection reports of the elevator, and provide, at the request of the Division, in company of a Division representative, a formal inspection of elevator contracted, submitting a formal written document for file.

ARTICLE 8. NON-ASSIGNMENT OF CONTRACT

The Contractor shall not assign or sell this contract or his rights or any monies due, or to become due hereunder, nor shall the Contractor subcontract any of its duties hereunder.

SUBCONTRACTOR – No part of the contract shall be sublet by the Contractor.

The Contractor and the Division, for themselves, their heirs, successors, executors and administrators, hereby agree to full performance of the covenants herein contained.

ARTICLE 9. COST AND ATTORNEY'S FEES

In case of default in carrying out the terms and conditions of this contract, the party in default agrees to pay a reasonable attorney's fee and all costs of the other part in enforcing this contract.

ARTICLE 10. CONTRACT SUM PAYMENT

For the period of _____, the Division agrees to pay and the Contractor agrees to accept the sum of _____ to be paid _____ per year, in monthly installments _____ each for full performance under this contract.

Original Contract $_____ not to exceed, not guaranteed

IN WITNESS WHEREOF, the parties have executed this contract on the day and year first above written.

CONTRACTOR:

_____

Name: Date

Title:

ATTEST:

_____

Secretary/Office/Witness Date

STATE OF UTAH/DIV. OF FACILITIES CONTRACTION AND MANAGEMENT

_____

Jake Jacobson Date

Managing Facilities Coordinator

APPROVED/FUNDS AVAILABILITY

_____

David D. Williams, Jr. Date

Div. Admin. Services Director

_____

Division of Purchasing Date

_____

Division of Finance Date

SPECIFICATIONS
FOR
ELEVATOR MAINTENANCE SERVICE
CONTRACT AGREEMENT FOR
OGDEN REGIONAL CENTER BUILDING

Contract#_____

The intent of this specification is to obtain comprehensive maintenance service through coordinated, scheduled maintenance so as to assure maximum peak elevator performance and reduce elevator down time.

The contractor shall be required to provide the aforementioned elevator maintenance service in strict accordance with this specification and be subject to terms and conditions of the contract beginning _____, and extending through _____.

Description of Work

Company shall supply trained, quailed, and technically skilled journeymen directly employed and supervised by Company. All supervision, installed repair parts, consumable materials, equipment, tools, and each and every item of expense necessary for elevator maintenance, including all preventative maintenance, repairs, or parts and trouble call service.

The Elevators covered under this specification are in the Ogden Regional Center Building located at 2540 Washington Blvd, Ogden, Utah 84401, and are described as:

Elevators #1, #2 and #3

Elevator Type:	Traction, geared passenger
Number of Landings/Openings:	8
Manufacturer:	U.S. Elevator Company
Unit Type:	A
Serial Number:	
Capacity and Speed:	2,500 lbs. at 350 fpm

Elevators #4

Elevator Type:	Traction, geared freight
Number of Landings/Openings:	2
Manufacturer:	U.S. Elevator Company and Gillespie
Unit Type:	A
Serial Number:	
Capacity and Speed:	2,000 lbs. at 50 fpm

Contract Specifications

Regularly and systematically examine, adjust, lubricate, clean, and when conditions warrant, repair or replace the following items and all other mechanical or electrical equipment.

Traction Elevators

1. Traction power unit and accessories: motor generator set, pulleys, drive belts, muffler, sound isolating coupling, and other components.
2. Controller, selector, and dispatching equipment: All components including all relays, solid state components, resistors, condenser, transformers, contacts, leads computer devices, selector switches, mechanical or electrical driving equipment, coils, magnet frames, contact switch assemblies, springs, solenoids, resistance grids, hoistway vanes, magnets and inductors.
3. Hoistway door interlocks or locks and contacts, hoistway door hanger, tracks, bottom door gibs, cams and rollers.
4. Hoistway limit switches, slowdown switches, leveling switches and associated cams, vanes and electronic components.
5. Guide shoes including rollers.
6. Automatic power operated door operators, door protective devices, car door hangers, tracks and car door contacts.
7. Automatic power operated door operators, door protective devices, car door hangers, tracks and car door contacts.
8. Elevator control wiring in hoistway and machine room.
9. Buffers
10. Fixture contacts, pushbuttons, key switches, locks, lamps, and sockets or button stations (car and hall), hall lanterns, position indicators, direction indicators.
11. The guide rails shall be kept free of rust and dry.
12. Examine all safety devices, and conduct an annual no load test, and every fifth year perform a full load, full speed test of the buffers. The car balance shall be checked. All tests shall be performed in accordance with the provisions of the American National Standard, Safety Code for Elevators and Escalators (ANSI/ASME A17.2), current edition.
13. Furnish lubricants compounded specifically for elevator usage.
14. All preventative maintenance and adjusting shall meet the minimum standards established by the original equipment manufacturer of the elevator equipment.

The Contractor will be financially responsible for the job they do and DFCM will call for damages for extended shutdowns or repeated shutdowns. If there are more than two shutdowns for the same reason within a One month period, DFCM will charge the Contractor $300 per occurrence.

Exclusions to this Contract:

The Elevator Contractor shall not be required to install new attachments on the elevator whether or not recommended or directed by insurance companies or by governmental authorities, nor make any

replacements with parts of a different design. The Contractor shall not be required to make renewals or repairs necessitated by reason of negligence or misuse of the equipment or by reason of any other cause beyond the Contractor's control except ordinary wear and tear unless the Contractor receives just compensation.

The Elevator Contractor shall not be responsible for the following items of elevator equipment: car enclosure (including removable panels, door panels, hung ceilings, light diffusers, light tubes and bulbs, handrails, and carpets), hoistway enclosure, hoistway doors, frames and sills.

Conditions of the Work:

All work is to be performed during regular working hours of regular workings days. Emergency calls shall be answered at all hours of the day or night. Should overtime work be required, DFCM will pay only the actual amount of the premium portion of the wage, the Contractor will pay the basic hourly rate.

The Contractor shall check the group dispatching systems and make necessary tests to insure that all circuits and time settings are properly adjusted, and that the system performs as designed and installed.

The Contractor shall keep the elevator maintained to operate at the original contract speed, keeping the original performance times, including acceleration and retardation as designed and installed by the manufacturer. The door operation shall be adjusted as required to maintain the original door opening and door closing times, within legal limits.

DFCM reserves the right to make a thorough inspection and test as and when deemed advisable. If it is found that the elevator and associated equipment are deficient either electrically or mechanically, the Contractor will be notified of these deficiencies in writing, and it shall be his responsibility to make corrections within 30 days, DFCM may terminate the contract and employ a Contractor to make the corrections at the original Contractor's expense.

Approximately six months prior to the end of the contract term, DFCM will make a thorough maintenance inspection of all elevators covered under the contract. At the conclusion of this inspection, DFCM shall give the Contractor written notice of any deficiencies within 30 days after receipt of such notice.

Parts Inventory Requirements: Contractor agrees to the following requirements and authorization of parts used.

1. One complete set of all diagnostic tools and equipment required for the complete maintenance of all aspects of the control and dispatch system and solid-state motor drive units. The diagnostic system shall be an integral part of the controller and provide user-friendly interaction between the serviceman and the controls. All such systems shall be free from secret codes and decaying circuits that must be periodically reprogrammed by the manufacturer.

2. All parts need to be readily available within five (5) working days.

3. Major Components Parts (Electrical): If Company does not have a motor and generator armatures, or should field coils and armatures be rewound or repaired by a qualified motor rewind shop, Company must cause the repairs to be completed within two (2) working days, or less.

4. Major Components Parts: If Company does not have machine gears, frames, sheaves, cabs, rails, and similar mechanical components in stock; they must provide DFCM within two working days. If this exceeds two working days, the Company will need to supply DFCM with the source for the repair or replacement, as well as, the approximate schedule to complete the repairs.

5. Special Electrical Parts: Company acknowledges that elevator control systems contain solid state printed circuit modules. Company agrees to maintain in inventory, a sufficient amount of modules and component parts to replace and or repair any of these units should failure occur. SCR Drive Components are to be inventoried in Companies warehouse.

6. Job Site Elevator Inventory: Company will maintain a supply of contacts, coils, generator, and motor brushes, car and hall pushbuttons, lantern gongs, door detectors, safety edges, photo eyes, lubricants, wiping cloths, and minor parts in each elevator machine room, properly stored in an approved parts cabinet.

7. Spare Parts Inventory: Company will maintain a supply of genuine Original Equipment Manufacturer's replacement parts in their warehouse inventory. This inventory will include, but not be limited to, generator rotating elements, door operator motors, brake magnets, generator and motor brushes, controller switch contracts, selector tapes, door hangers, rollers, hoistway limit switches. Such replacement parts will be kept in warehouse inventory or available from their manufacturing facilities. Regardless of the location of the stored parts, they shall be available on the job site within forty-eight (48) hours from the time of need.

8. Replacement Parts Policy: Company will not alter equipment parts and original design with other manufacturers' parts or design unless the original manufacturer has discontinued the item and the parts are no longer available from the manufacturer or other DFCM approved suppliers. Parts manufactured by companies other the original manufacturer, but supplied to the manufacturer as part of their overall product may be acceptable if said part is of a similar design and character. Relays, selector parts, coils, rollers, touch buttons, proximity edges, and various other parts are duplicated by other national recognized manufacturers and, upon written authorization from DFCM or DFCM's representative, may be used in lieu of the manufacturers parts. Company agrees to maintain a diagnostic tool to remain on the job site, and One set of spare boards, as

required, on the job site or in Companies local branch office for the entire length of the Agreement. Any boards used out of stock will be replaced within twenty-four (24) hours.

Modification Approvals: Should Contractor request or wish to make any change, modification, or addition to the existing elevator equipment, the Contractor must submit a written "Request to Modify" proposal to DFCM for approval. A "Request to Modify" must state the reason why the Company wishes to change a component. Complete information of the new proposed component and a guarantee of responsibility by Company for said component change are required. DFCM will get back with the Company within 30 days of receiving this request.

Emergency Response: In the case of entrapment by an individual inside an elevator, the Company will respond within an hour of receiving the call.

Code Testing Required: Company shall perform all State, City, Local and ANSI A17.1 required testing. Such testing shall include, but not limited to, full load, no load, and hydraulic load tests, Only those Codes that are in force as of the Commencement Date of this Agreement are applicable. Company will give DFCM at least a One day notice prior to any testing being performed.

1. ANSIASME A17.1 (Latest edition): Company shall test Fireman's Return Phase I and II, a minimum of once a year, and notify DFCM prior to conducting such test. Any and all required corrections shall be the responsibility of Company and shall be corrected at no additional charge to DFCM. The results of these tests shall be submitted in writing to DFCM within 30 days after test is completed.
2. Earthquake Derailment Device Testing: Company shall test earthquake derailment and seismic devices a minimum of once a year only in areas where applicable. Notification shall be given to DFCM prior to such test. Any and all required corrections shall be the responsibility of Company and shall be corrected at no addition charge to DFCM.

Performance Requirements: Contractor agrees to maintain the following minimum requirements of each elevator and lift as described per manufacturer's original installation criteria.

1. Floor-to Floor Time: (In Seconds)
   Floor to floor time shall be measured from the time the elevator starts to the time the elevator stops during a one floor run in either direction and under any load condition.
2. Door-Open Time: (In Seconds)
   Door-opening times are measured by the distance of the door travel less 1" for center-opening doors and 2" for side-opening doors from each end of the door travel.
3. Door-Close Time: (In Seconds)
   Not to exceed 30 pounds of kinetic force.
   Door closing times are measured by the distance of the door travel less 1" for center-opening doors and 2" for side-opening doors from each end of the door travel.
4. Car/Hall Dwell Time: (In Seconds)
   Standing door open times are measured from the time the doors are fully open, without demand, until the doors start to close.

5. Nudging Close Time: (In Seconds)
   Nudging close time is measured the same as the door close time.
6. Leveling Accuracy
   3/8” for hydraulic elevators and open loop traction elevators.
   1/4” for closed loop traction elevators.
   The accuracy of leveling shall be plus or minus the 3/8” and 1/4" mentioned above under all load conditions. Leveling shall be consistent with OEM installation and Code Requirements.
7. Variance from the rated contract speed, regardless of load conditions shall not exceed five percent (5%).
8. Maintain vertical alignment of guide rails to a tolerance of 1/16 in. at 100’.
   To accomplishing this, Company shall maintain a comfortable a comfortable elevator ride with smooth acceleration, retardation and a soft stop. Door operation shall be quiet and positive, with smooth checking at the extremes of travel. Company shall assign a Supervisor to examine all equipment yearly as a minimum requirement. Results of the inspection shall be submitted to DFCM within thirty (30) days from completion of Supervisor’s Inspection.

Minimum Man Hours at Premises

1. Company shall furnish a mechanic to provide preventative maintenance services at the premises for a minimum of One (1) hour per calendar month per hydraulic elevator. **Callbacks and nonscheduled repair labor are not considered service time.** Failure to provide the preventative maintenance services set forth, shall be cause for retention of monthly fees by DFCM equal to the reduction of Company services and shall continue until full, normal services is restored. Company may choose to make up time lost at the conclusion of any period of interruption of service and be reimbursed for same if agreed to in writing by DFCM. Time tickets for routine maintenance shall be presented to the appropriate on site personnel or building representative at the conclusion of each visit and shall only show the time spent for preventative maintenance. Any other work completed, such as repairs or call back service shall be listed and accounted for on a separate time ticket. It is understood that such minimum service hours do not limit labor required to maintain the elevator equipment in top running condition.

2. All preventative maintenance service, repairs, routine adjusting and service procedures will be performed during regular working hours of regular working days of the elevator trade referring to the hours of 8:00 a.m. to 4:30 p.m., Monday through Friday. If DFCM demands that needed two-man repair work be completed during overtime hours, Company will bill the difference between their straight time billing rate and the appropriate overtime billing rate. Notification to DFCM must be made prior to removal of the elevators from normal service for maintenance, testing and adjustment.

End of Specifications for Elevator Maintenance Service Contract Agreement

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Work covered by the Contract Documents.
2. Work phases.
3. Work under other contracts.
4. Use of premises.
5. Owner's occupancy requirements.
6. Specification formats and conventions.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Ogden Regional Center – Elevator Modernization, DFCM No.09071310

1. Project Location: 2540 Washington Blvd, Ogden, Utah 84401

B. Owner: State of Utah, Department of Administrative Services, Division of Facilities Construction and Management, State Office Building, Suite 4110, Salt Lake City, Utah 84114

C. Owner's Representative: Robert Anderson, State Office Building, Suite 4110, Salt Lake City, Utah 84114

D. Architect: JSA Architects, 6465 South 3000 East, Suite 205, Salt Lake City, Utah 84121

E. The Work consists of the following:

1. The Work includes modernization of 3 existing passenger elevators and one existing service elevator. Also included are minor upgrades to associated elevator lobbies including new lay-in ceilings and painted walls.

F. Project will be constructed under a single prime contract except that Owner will allow elevator carpet to be purchased by the General Contractor through a State Purchasing Agreement. General Contractor shall include purchase (at State’s discount), delivery and installation of elevator carpet in Base Bid price.

1.3 WORK PHASES

A. The Work shall be conducted in 3 (three) phases in the following order, with each phase substantially complete before beginning the next phase:

1. Phase 1: Modernize Elevator No. 1, Service Elevator and lobbies 6 and 7. Work of this phase shall be substantially complete and ready for occupancy within 15 work weeks after Owner issues Notice to Proceed.
2. Phase 2: Modernize Elevator No. 2, and lobbies 5 and 4. Work of this phase shall be substantially complete and ready for occupancy within 8 work weeks after Phase 1 Substantial Completion.
3. Phase 3: Modernize Elevator No. 3, and lobbies 3, 2 and 1. Work of this phase shall be substantially complete and ready for occupancy within 8 work weeks after Substantial Completion of Phase 2.
4. A final, 1 week effort will be allowed to install all interior finishes in each of the 3 passenger elevators and to conduct a final Punch List.

B. Before commencing Work of each phase, submit a schedule showing the sequence, commencement and completion dates, and move-out and -in dates of Owner's personnel for all phases of the Work.

1.4 USE OF PREMISES

A. General: Contractor shall have limited use of premises for construction operations as indicated on Drawings by the Contract limits.

B. Use of Site: Limit use of premises to elevator machine rooms, their related spaces and elevator lobbies and in the sequences indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. Owner Occupancy: Owner and public must continue to have full, uninterrupted access to all floors during all Phases of this project. Temporary barricades and curtaining may be used with Owner’s permission, prior notice and careful scheduling.
2. Driveways and Entrances: Keep driveways, parking garage, loading areas and entrances serving premises clear and available to Owner, Owner's employees, public and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

    a. Schedule deliveries to minimize use of driveways and entrances.
    b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

C. Use of Existing Building: Maintain existing building in a weathertight condition throughout construction period. Repair damage caused by construction operations. Protect building and its occupants during construction period.

1.5 OWNER'S OCCUPANCY REQUIREMENTS

A. Full Owner Occupancy: Owner will occupy site and adjacent parking terrace during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits, unless otherwise indicated.

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.

B. Owner Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed areas of building, before Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and partial occupancy shall not constitute acceptance of the total Work.

1. Architect will prepare a Certificate of Substantial Completion for each Phase of the Work to be occupied before total Owner occupancy.
2. Before partial Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied Phases of the building.
3. Upon occupancy of each Phase, Owner will assume responsibility for maintenance and custodial service for occupied portions of building.
4. Upon date of Substantial Completion of each Phase, warranties for lights and equipment will commence.

1.6 WORK RESTRICTIONS

A. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet of entrances, operable windows, or outdoor air intakes.

1.7 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the 16-division format and CSI/CSC's "MasterFormat" numbering system.

1. Division 01: Sections in Division 01 govern the execution of the Work of all Sections in the Specifications.

B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.

a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

END OF SECTION 011000

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.

B. See Division 01 Section "Allowances" for procedural requirements for handling and processing allowances.

C. See Division 01 Section "Unit Prices" for administrative requirements for using unit prices.

1.2 MINOR CHANGES IN THE WORK

A. Architect will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on [**AIA Document G710, "Architect's Supplemental Instructions."**] [**form included at end of Part 3.**]

1.3 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
2. Within [**time specified in Proposal Request**] [**20 days**] <**Insert number of days**> after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

    a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    c. Include costs of labor and supervision directly attributable to the change.
    d. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to Architect.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Division 01 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

C. Proposal Request Form: Use [**AIA Document G709 for Proposal Requests**] [**forms provided by Owner. Sample copies are included at end of this Section**].

1.4 ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, base each Change Order proposal on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.

1. Include installation costs in purchase amount only where indicated as part of the allowance.
2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
3. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.
4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the Purchase Order amount or Contractor's handling, labor, installation, overhead, and profit. Submit claims within [**21**] <**Insert number**> days of receipt of the Change Order or Construction Change Directive authorizing work to proceed. Owner will reject claims submitted later than [**21**] <**Insert number**> days after such authorization.

1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

1.5 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on [**AIA Document G701**] [**form included at end of Part 3**].

1.6 CONSTRUCTION CHANGE DIRECTIVE

A. [**Construction**] [**Work**] Change Directive: Architect may issue a [**Construction**] [**Work**] Change Directive on [**AIA Document G714**] [**EJCDC Document 1910-8-F**] [**form included at end of Part 3**]. [**Construction**] [**Work**] Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. [**Construction**] [**Work**] Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the [**Construction**] [**Work**] Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Contractor's Construction Schedule.
2. Submittals Schedule.
3. Daily construction reports.
4. Field condition reports.

B. See Division 01 Section "Multiple Contract Summary" for preparing a combined Contractor's Construction Schedule.

C. See Division 01 Section "Payment Procedures" for submitting the Schedule of Values.

D. See Division 01 Section "Photographic Documentation" for submitting construction photographs.

1.2 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

D. Float: The measure of leeway in starting and completing an activity.

1. Float time [**belongs to Owner**] [**is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date**].

E. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

F. Major Area: A story of construction, a separate building, or a similar significant construction element.

1.3 SUBMITTALS

A. Submittals Schedule: Submit [**three**] <**Insert number**> copies of schedule. Arrange the following information in a tabular format:

1. Scheduled date for first submittal.
2. Specification Section number and title.
3. Submittal category (action or informational).
4. Name of subcontractor.
5. Description of the Work covered.
6. Scheduled date for Architect's final release or approval.

B. Preliminary Network Diagram: Submit [**two**] <**Insert number**> opaque copies, large enough to show entire network for entire construction period. Show logic ties for activities.

C. Contractor's Construction Schedule: Submit [**two**] <**Insert number**> opaque copies of initial schedule, large enough to show entire schedule for entire construction period.

1. Submit an electronic copy of schedule, using software indicated, on CD-R, and labeled to comply with requirements for submittals. Include type of schedule (Initial or Updated) and date on label.

D. CPM Reports: Concurrent with CPM schedule, submit [**three**] <**Insert number**> copies of each of the following computer-generated reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.

1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
3. Total Float Report: List of all activities sorted in ascending order of total float.

E. Daily Construction Reports: Submit [**two**] <**Insert number**> copies at [**weekly**] [**monthly**] intervals.

F. Field Condition Reports: Submit [**two**] <**Insert number**> copies at time of discovery of differing conditions.

1.4 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from parties involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.

1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
2. Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for [**commencement of the Work**] [**the Notice of Award**] [**the Notice to Proceed**] to date of [**Substantial**] [**Final**] Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

B. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than [**20**] <**Insert number**> days, unless specifically allowed by Architect.
2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.

    a. <**Insert list of major items or pieces of equipment.**>

3. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
4. Startup and Testing Time: Include not less than <**Insert number**> days for startup and testing.

5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.

C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Phasing: Arrange list of activities on schedule by phase.
2. Work under More Than One Contract: Include a separate activity for each contract.
3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
4. Work Restrictions: Show the effect of the following items on the schedule:

a. Coordination with existing construction.
b. Limitations of continued occupancies.
c. Uninterruptible services.
d. Partial occupancy before Substantial Completion.
e. Use of premises restrictions.
f. Provisions for future construction.
g. Seasonal variations.
h. Environmental control.

5. Work Stages: Indicate important stages of construction for each major portion of the Work.
6. Other Constraints: <**Insert additional constraints not indicated elsewhere.**>

D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion[**.**] [**, and the following interim milestones:**]

1. <**Insert additional milestones not indicated elsewhere.**>

E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule within [**30**] <**Insert number**> days of date established for [**commencement of the Work**] [**the Notice to Proceed**] [**the Notice of Award**]. Base schedule on the Preliminary Construction Schedule and whatever updating and feedback was received since the start of Project.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

1. For construction activities that require 3 months or longer to complete, indicate an estimated completion percentage in [**10**] <**Insert number**> percent increments within time bar.

2.4 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

A. General: Prepare network diagrams using AON (activity-on-node) format.

B. Preliminary Network Diagram: Submit diagram within [**14**] <**Insert number**> days of date established for [**commencement of the Work**] [**the Notice to Proceed**] [**the Notice of Award**]. Outline significant construction activities for the first [**60**] <**Insert number**> days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

C. CPM Schedule: Prepare Contractor's Construction Schedule using a computerized,[**cost- and resource-loaded,**] time-scaled CPM network analysis diagram for the Work.

1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than [**30**] <**Insert number**> days after date established for [**commencement of the Work**] [**the Notice to Proceed**] [**the Notice of Award**].

    a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.

2. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
3. Use "one workday" as the unit of time. Include list of nonworking days and holidays incorporated into the schedule.

D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.

1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:

    a. Preparation and processing of submittals.
    b. Mobilization and demobilization.
    c. Purchase of materials.
    d. Delivery.
    e. Fabrication.
    f. Utility interruptions.
    g. Installation.
    h. Work by Owner that may affect or be affected by Contractor's activities.
    i. Testing[**and commissioning**].

2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.

4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.

    a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.

E. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:

1. Contractor or subcontractor and the Work or activity.
2. Description of activity.
3. Principal events of activity.
4. Immediate preceding and succeeding activities.
5. Early and late start dates.
6. Early and late finish dates.
7. Activity duration in workdays.
8. Total float or slack time.
9. Average size of workforce.

F. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:

1. Identification of activities that have changed.
2. Changes in early and late start dates.
3. Changes in early and late finish dates.
4. Changes in activity durations in workdays.
5. Changes in the critical path.
6. Changes in total float or slack time.
7. Changes in the Contract Time.

2.5 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. Equipment at Project site.
3. Material deliveries.
4. High and low temperatures and general weather conditions.
5. Accidents.
6. Stoppages, delays, shortages, and losses.
7. Meter readings and similar recordings.
8. Orders and requests of authorities having jurisdiction.
9. Services connected and disconnected.
10. Equipment or system tests and startups.

B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation[**on CSI Form 13.2A**]. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At [**monthly**] <**Insert time**> intervals, update schedule to reflect actual construction progress and activities. Issue schedule [**one week**] <**Insert time**> before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate Actual Completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Architect Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 013200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

B. See Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule.

C. See Division 01 Section "Photographic Documentation" for submitting [**construction photographs**] [**and**] [**construction videotapes**].

D. See Division 01 Section "Quality Requirements" for submitting test and inspection reports[**and for mockup requirements**].

E. See Division 01 Section "Closeout Procedures" for submitting warranties.

F. See Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.

G. See Division 01 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.

H. See Division 01 Section "Demonstration and Training" for submitting videotapes of demonstration of equipment and training of Owner's personnel.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Architect's responsive action.

B. Informational Submittals: Written information that does not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.3 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

B. Submittals Schedule: Comply with requirements in Division 01 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.

C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow [**15**] <**Insert number**> days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow [**15**] <**Insert number**> days for review of each resubmittal.

D. Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately [**6 by 8 inches (150 by 200 mm)**] <**Insert size**> on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
3. Include the following information on label for processing and recording action taken:

a. Project name.
b. Date.
c. Name and address of Architect.
d. Name and address of Contractor.
e. Name and address of subcontractor.
f. Name and address of supplier.
g. Name of manufacturer.
h. Submittal number or other unique identifier, including revision identifier.

1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).

i. Number and title of appropriate Specification Section.
j. Drawing number and detail references, as appropriate.
k. Location(s) where product is to be installed, as appropriate.
l. Other necessary identification.

E. Deviations: Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.

F. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

1. Additional copies submitted for maintenance manuals will[**not**] be marked with action taken and will be returned.

G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will [**return submittals, without review,**] [**discard submittals**] received from sources other than Contractor.

1. Transmittal Form: Use [**AIA Document G810**] [**CSI Form 12.1A**] [**facsimile of sample form at end of Section**].

H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked "<**Insert approval notation from Architect's action stamp**>."

I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

J. Use for Construction: Use only final submittals with mark indicating "<**Insert approval notation from Architect's action stamp**>" taken by Architect.

1.4 CONTRACTOR'S USE OF ARCHITECT'S CAD FILES

A. General: At Contractor's written request, copies of Architect's CAD files will be provided to Contractor for Contractor's use in connection with Project, subject to the following conditions:

1. <**Insert conditions on which CAD files will made available.**>

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

a. Manufacturer's written recommendations.
b. Manufacturer's product specifications.
c. Manufacturer's installation instructions.
d. Manufacturer's catalog cuts.
e. Wiring diagrams showing factory-installed wiring.
f. Printed performance curves.
g. Operational range diagrams.
h. Compliance with specified referenced standards.
i. Testing by recognized testing agency.

4. Number of Copies: Submit [**three**] <**Insert number**> copies of Product Data, unless otherwise indicated. Architect will return [**two**] <**Insert number**> copies. Mark up and retain one returned copy as a Project Record Document.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data[**, unless submittal of Architect's CAD Drawings is otherwise permitted**].

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

a. Dimensions.
b. Identification of products.
c. Fabrication and installation drawings.
d. Roughing-in and setting diagrams.
e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
f. Shopwork manufacturing instructions.
g. Templates and patterns.
h. Schedules.
i. Notation of coordination requirements.
j. Notation of dimensions established by field measurement.
k. Relationship to adjoining construction clearly indicated.
l. Seal and signature of professional engineer if specified.
m. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 40 inches (750 by 1000 mm).
3. Number of Copies: Submit two opaque (bond) copies of each submittal. Architect will return one copy.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:

a. Generic description of Sample.
b. Product name and name of manufacturer.
c. Sample source.
d. Number and title of appropriate Specification Section.

3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

a. Number of Samples: Submit [**one**] <**Insert number**> full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

a. Number of Samples: Submit [**three**] <**Insert number**> sets of Samples. Architect will retain [**two**] <**Insert number**> Sample sets; remainder will be returned.[**Mark up and retain one returned Sample set as a Project Record Sample.**]

E. Product Schedule or List: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location.

1. Number of Copies: Submit [**three**] <**Insert number**> copies of product schedule or list, unless otherwise indicated. Architect will return [**two**] <**Insert number**> copies.

F. Submittals Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."

G. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."

H. Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."

I. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design.[**Use CSI Form 1.5A.**]

1. Number of Copies: Submit [**three**] <**Insert number**> copies of subcontractor list, unless otherwise indicated. Architect will return [**two**] <**Insert number**> copies.

J. LEED Submittals: Comply with requirements specified in Division 01 Section "Sustainable Design Requirements."

1. Number of Copies: Submit [**three**] <**Insert number**> copies of LEED submittals, unless otherwise indicated.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification Sections.

1. Number of Copies: Submit [**two**] <**Insert number**> copies of each submittal, unless otherwise indicated. Architect will not return copies.
2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
3. Test and Inspection Reports: Comply with requirements specified in Division 01 Section "Quality Requirements."

B. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."

C. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."

D. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

H. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

I. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

J. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

K. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

L. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.

M. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

N. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

O. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

P. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."

Q. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

R. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer.

S. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:

1. Statement on condition of substrates and their acceptability for installation of product.
2. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.

T. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

U. Construction [**Photographs**] [**and**] [**Videotapes**]: Comply with requirements specified in Division 01 Section "Photographic Documentation."

V. Material Safety Data Sheets (MSDSs): Submit information directly to Owner; do not submit to Architect.

1. Architect will not review submittals that include MSDSs and will return them for resubmittal.

2.3 DELEGATED DESIGN

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit [**three**] <**Insert number**> copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:

1. <**Insert description of each action indicated on Architect's stamp.**>

C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

D. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION 013300

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes requirements for temporary utilities, support facilities, toilets and security and protection facilities.

1.2 USE CHARGES

A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect, consulting engineers, vendors, testing agencies, and authorities having jurisdiction.

B. Water Service: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

C. Electric Power Service: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.3 SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

1.4 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Portable Chain-Link Fencing: Minimum 2-inch, 9-gage, galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top and bottom rails. Provide either concrete or galvanized steel bases for supporting posts.

2.2 TEMPORARY FACILITIES

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

C. Portable Toilets: Provide and maintain standard, easily cleanable and regularly serviced portable toilets for construction personnel. Construction personnel are strictly prohibited from using any existing lavatories on site.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

B. HVAC Equipment:

1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
2. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
3. Permanent HVAC System: Owner will allow use of building’s permanent HVAC system for use during construction..

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

1. Locate facilities to limit site disturbance as specified in Division 01 Section "Summary."

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Water Service: Use of Owner's existing water service facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

1. Where installations below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize water damage. Drain accumulated water promptly from pans.

C. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

D. Electric Power Service: Use of Owner's existing electric power service will be permitted, as long as equipment is maintained in a condition acceptable to Owner.

E. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

F. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one (1) telephone line(s) for each field office.

1. Provide additional telephone lines for the following:

a. Provide a dedicated telephone line for each facsimile machine and computer in each field office.

2. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

G. Electronic Communication Service: Provide temporary electronic communication service, including electronic mail in field office.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Provide incombustible construction for offices, shops, and sheds located within construction area or within 30 feet of building lines. Comply with NFPA 241.
2. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

C. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

D. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with Division 01 Section "Execution" for progress cleaning requirements.

E. Existing Elevator Use: Use of Owner's existing elevators will be permitted, as long as elevators are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore elevators to condition existing before initial use, including replacing worn cables, guide shoes, and similar items of limited life.

1. Provide protective coverings, barriers, devices, signs, or other procedures to protect elevator car and entrance doors and frame. If, despite such protection, elevators become damaged, engage elevator Installer to restore damaged work so no evidence remains of correction work. Return items that cannot be refinished in field to the shop, make required repairs and refinish entire unit, or provide new units as required.

F. Existing Stair Usage: Use of Owner's existing stairs will be permitted, as long as stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.

1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If, despite such protection, stairs become damaged, restore damaged areas so no evidence remains of correction work.

G. Temporary Use of Permanent Stairs: Cover finished, permanent stairs with protective covering of plywood or similar material so finishes will be undamaged at time of acceptance.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Site Enclosure Fence: Before construction operations begin furnish and install staging area enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
1. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Provide Owner with one set of keys. Owner will provide pass cards to building

B. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.

C. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

D. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner and visitors from fumes and noise.

1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant plywood on construction operations side.
2. Construct dustproof partitions with 2 layers of 3-mil polyethylene sheet on each side. Cover floor with 2 layers of 3-mil polyethylene sheet, extending sheets 18 inches up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant plywood.

a. Construct vestibule and airlock at each entrance through temporary partition with not less than 48 inches between doors. Maintain slip-proof foot mats in vestibule.

3. Insulate partitions to provide noise protection to occupied areas.
4. Seal joints and perimeter. Equip partitions with dustproof doors and security locks.
5. Protect air-handling equipment.
6. Weather strip openings.
7. Provide walk-off mats at each entrance through temporary partition.

E. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.

1. Prohibit smoking in construction areas.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.5 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
2. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

END OF SECTION 015000

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.
2. Warranties.
3. Final cleaning.

B. See Division 01 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.

C. See Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.

D. See Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.

E. See Divisions 02 through 49 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.2 SUBSTANTIAL COMPLETION

A. Coordinate preliminary Punch Lists in the Phase sequence described in Section 011000.1.3.

B. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion of each Phase, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected **(punch list**), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, if required, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Make final changeover of permanent locks and deliver keys and pass badges to Owner. Advise Owner's personnel of changeover in security provisions.

8. Complete startup testing of systems.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover in heat and other utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

C. Inspection: Submit a written request for inspection for Substantial Completion of each Phase. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.3 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion of all Phases, complete the following:

1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three (3) copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with passenger elevator machine room, continuing down the elevator lobbies and concluding in the basement and loading dock.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

1.5 WARRANTIES

A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

C. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Remove snow and ice to provide safe access to building.
f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
h. Sweep concrete floors broom clean in unoccupied spaces.
i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
k. Remove labels that are not permanent.
l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.

m. Wipe surfaces of mechanical and electrical equipment**, elevator equipment,** and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
n. Replace parts subject to unusual operating conditions.

o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
q. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
r. Leave Project clean and ready for occupancy.

C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
   1. Operation manuals for systems, subsystems, and equipment.
   2. Maintenance manuals for the care and maintenance of new elevator systems and equipment.

B. See Divisions 02 through 49 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.2 SUBMITTALS

A. Manual: Submit one (1) draft copy of each manual in final form at least fifteen (15) work days before final inspection. Architect will return copy with comments within fifteen (15) work days after final inspection.

   1. Correct or modify each draft copy of the manual to comply with Architect's comments. Submit two (2) final copies of each corrected manual within fifteen (15) work days of receipt of Architect's comments.

PART 2 - PRODUCTS

2.1 MANUALS, GENERAL

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain a title page, table of contents, and manual contents.

B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:

   1. Subject matter included in manual.
   2. Name and address of Project.
   3. Name and address of Owner.
   4. Date of submittal.
   5. Name, address, and telephone number of Contractor.
   6. Name and address of Architect.
   7. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

    a. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

    a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
    b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.2 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and equipment descriptions, operating standards, operating procedures, operating logs, wiring and control diagrams, and license requirements.

B. Descriptions: Include the following:

1. Product name and model number.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include start-up, break-in, and control procedures; stopping and normal shutdown instructions; routine, normal, seasonal, and weekend operating instructions; and required sequences for electric or electronic systems.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

2.3 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including maintenance instructions, drawings and diagrams for maintenance, nomenclature of parts and components, and recommended spare parts for each component part or piece of equipment:

D. Maintenance Procedures: Include test and inspection instructions, troubleshooting guide, disassembly instructions, and adjusting instructions, and demonstration and training videotape if available, that detail essential maintenance procedures:

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

D. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

E. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.

1. Do not use original Project Record Documents as part of operation and maintenance manuals.

F. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.

B. See Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.

C. See Divisions 02 through 49 Sections for specific requirements for Project Record Documents of the Work in those Sections.

1.2 SUBMITTALS

A. The following documents shall be submitted to the Architect within five (5) work days of the date of Final Completion:

B. Record Drawings: Comply with the following:

1. Number of Copies: Submit one (1) set of marked-up Record Prints.

C. Record Specifications: Submit one (1) copy of marked-up Project's Specifications, including addenda and contract modifications.

D. Record Product Data: Submit one (1) copy of each Product Data submittal.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.

1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

2. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize Record Prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Identification: As follows:

a. Project name.
b. Date.
c. Designation "PROJECT RECORD DRAWINGS."
d. Name of Architect.
e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. Note related Change Orders and Record Drawings where applicable.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.

3. Note related Change Orders and Record Drawings where applicable.

2.4 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.

B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

END OF SECTION 017839

SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Demolition and removal of selected portions of building or structure.
2. Demolition and removal of selected site elements.
3. Salvage of existing items to be reused or recycled.

B. See Division 01 Section "Construction Waste Management and Disposal" for disposal of demolished materials.

C. See Division 31 Section "Site Clearing" for site clearing and removal of above- and below-grade improvements.

1.2 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Detach items from existing construction and deliver them to Owner[**ready for reuse**].

C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 SUBMITTALS

A. Schedule of Selective Demolition Activities: Indicate detailed sequence of selective demolition and removal work, with starting and ending dates for each activity, interruption of utility services, use of elevator and stairs, and locations of temporary partitions and means of egress.

B. Predemolition [**Photographs**] [**or**] [**Videotapes**]: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by selective demolition operations. Comply with Division 01 Section "Photographic Documentation." Submit before Work begins.

C. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1. Comply with submittal requirements in Division 01 Section "Construction Waste Management and Disposal."

1.4 QUALITY ASSURANCE

A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.

B. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

C. LEED Requirements for Building Reuse:

1. Credit MR 1.1[**and 1.2**]: Maintain existing building structure (including structural floor and roof decking) and envelope (exterior skin and framing, excluding window assemblies and nonstructural roofing material) not indicated to be demolished; do not demolish such existing construction beyond indicated limits.
2. Credit MR 1.3: Maintain existing interior nonstructural elements (interior walls, doors, floor coverings, and ceiling systems) not indicated to be demolished; do not demolish such existing construction beyond indicated limits.
3. Credit MR 1.2[**and 1.3**]: Maintain existing nonshell, nonstructural components (walls, flooring, and ceilings) not indicated to be demolished; do not demolish such existing construction beyond indicated limits.

D. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

E. Standards: Comply with ANSI A10.6 and NFPA 241.

F. Predemolition Conference: Conduct conference at [**Project site**] <**Insert location**>.

1.5 PROJECT CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

1. Before selective demolition, Owner will remove the following items:

a. <**Insert items to be removed by Owner.**>

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. Hazardous materials [**will be removed by Owner before start of the Work**] [**have been removed by Owner under a separate contract**].
2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Owner will remove hazardous materials under a separate contract.

E. Hazardous Materials: It is unknown whether hazardous materials will be encountered in the Work.

1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Owner will remove hazardous materials under a separate contract.

F. Hazardous Materials: Hazardous materials are present in construction to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.

1. Hazardous material remediation is specified elsewhere in the Contract Documents.
2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.

G. Storage or sale of removed items or materials on-site is not permitted.

H. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

1.6 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

E. Engage a professional engineer to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.

F. Survey of Existing Conditions: Record existing conditions by use of [**measured drawings**] [**preconstruction photographs**] [**preconstruction videotapes**] [**and**] [**templates**].

1. Comply with requirements specified in Division 01 Section "Photographic Documentation."

G. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.

B. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Arrange to shut off indicated utilities with utility companies.
2. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

3.3 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Comply with requirements for access and protection specified in Division 01 Section "Temporary Facilities and Controls."

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

3.4 SELECTIVE DEMOLITION

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain[**fire watch and**] portable fire-suppression devices during flame-cutting operations.
4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
5. Dispose of demolished items and materials promptly.[**Comply with requirements in Division 01 Section "Construction Waste Management and Disposal."**]

B. Reuse of Building Elements: Project has been designed to result in end-of-Project rates for reuse of building elements as follows. Do not demolish building elements beyond what is indicated on Drawings without Architect's approval.

1. Building Structure and Shell: [**75**] [**100**] percent.
2. Nonshell Elements: 50 percent.

C. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area [**on-site**] [**off-site**] [**designated by Owner**] [**indicated on Drawings**].
5. Protect items from damage during transport and storage.

D. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable,

protected storage location during selective demolition[**and cleaned**] and reinstalled in their original locations after selective demolition operations are complete.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be[**recycled,**] reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Comply with requirements specified in Division 01 Section "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.6 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes acoustical panels and exposed suspension systems for ceilings.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Coordination Drawings: Drawn to scale and coordinating acoustical panel ceiling installation with hanger attachment to building structure and ceiling mounted items:

C. Samples: For each exposed finish.

1.3 QUALITY ASSURANCE

A. Acoustical Testing Agency Qualifications: An independent testing laboratory or an NVLAP-accredited laboratory.

B. Fire-Test-Response Characteristics:

1. Fire-Resistance Characteristics: Where indicated, provide acoustical panel ceilings identical to those of assemblies tested for fire resistance per ASTM E 119 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

    a. Identify materials with appropriate markings of applicable testing and inspecting agency.

2. Surface-Burning Characteristics: Acoustical panels complying with ASTM E 1264 for Class B materials, when tested per ASTM E 84.

    a. Smoke-Developed Index: 450 or less.

C. Seismic Standard: Comply with the following:

1. Standard for Ceiling Suspension Systems Requiring Seismic Restraint: Comply with ASTM E 580.
2. CISCA's Guidelines for Systems Requiring Seismic Restraint: Comply with CISCA's "Guidelines for Seismic Restraint of Direct-Hung Suspended Ceiling Assemblies--Seismic Zones 3 & 4."
3. ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 9, "Earthquake Loads."

1.4 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Acoustical Ceiling Panels: Full-size panels equal to five (5) percent of quantity installed.
2. Suspension System Components: Quantity of each exposed component equal to two (2) percent of quantity installed.

PART 2 - PRODUCTS

2.1 ACOUSTICAL PANEL CEILINGS, GENERAL

A. Acoustical Panel Standard: Comply with ASTM E 1264.

B. Metal Suspension System Standard: Comply with ASTM C 635.

C. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

1. Anchors in Concrete: Where it is found that existing anchors are inadequate to re-use and new anchors are needed, provide shot-in-place expansion anchors fabricated from corrosion-resistant materials, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five (5) times that imposed by ceiling construction, as determined by testing per ASTM E 488 or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.

D. Wire Hangers, Braces, and Ties: Zinc-coated carbon-steel wire; ASTM A 641/A 641M, Class 1 zinc coating, soft temper.

1. Size: Select wire diameter so its stress at 3 times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch diameter wire.

E. Seismic perimeter stabilizer bars, seismic struts, and seismic clips.

F. Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension system runners.

2.2 ACOUSTICAL PANELS FOR ACOUSTICAL PANEL CEILING

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

1. Armstrong World Industries, Inc.; Fine Fissured, Second Look II, 24”x48”x ¾”, item no. 1761, white.

B. LR: Not less than 0.84.

C. NRC: Not less than 0.50, Type E-400 mounting per ASTM E 795.

D. Edge/Joint Detail: Angled tegular, sized to fit flange of exposed suspension system members.

2.3 METAL SUSPENSION SYSTEM FOR ACOUSTICAL PANEL CEILING

A. Products: Subject to compliance with requirements, provide one of the following:

1. Armstrong World Industries, Inc.; Prelude 15/16”, white

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with seismic design requirements indicated, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

B. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders.

C. Suspend ceiling hangers from building's structural members, plumb and free from contact with insulation or other objects within ceiling plenum. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers, use trapezes or equivalent devices. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.

1. Do not support ceilings directly from permanent metal forms or floor deck; anchor into concrete slabs.
2. Do not attach hangers to steel deck tabs.

D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.

E. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

F. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.

END OF SECTION 095113

SECTION 096813 - TILE CARPETING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes modular, loop carpet tile.

1.2 SUBMITTALS

A. Product Data: For each product indicated.

B. Samples: For each color and texture required.

1. Carpet Tile: Full-size Sample.

C. Maintenance data.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who is certified by the Floor Covering Installation Board or who can demonstrate compliance with its certification program requirements, or who is pre-qualified by Utah State DFCM.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Comply with CRI 104, Section 5, "Storage and Handling."

1.5 PROJECT CONDITIONS

A. Comply with CRI 104, Section 7.2, "Site Conditions; Temperature and Humidity" and Section 7.12, "Ventilation."

1.6 WARRANTY

A. Special Warranty for Carpet Tiles: Manufacturer's standard form in which manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, and delamination.

1. Warranty Period: ten (10) years from date of Substantial Completion.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Carpet Tile: Full-size units equal to three (3) percent of amount installed for each type indicated, but not less than 2 sq. yd.

PART 2 - PRODUCTS

2.1 CARPET TILE:

A. Products: Subject to compliance with requirements, provide the following:

2.2 Lees, modular Weave #428 “Monroe”

A. Fiber Content: 100 percent nylon

B. Fiber Type: Antron Legacy nylon

C. Pile Characteristic: Level-loop pile.

D. Dye System: Yarn dyed and solution dyed

E. Pile Thickness: 1/12” finished carpet tile per ASTM D 6859.

F. Backing material: Encycle modular by Lees, 100% PVC-free thermoplastic

G. Gage: 6,6

H. Total Weight: 24 oz./sq. yd**.** for finished carpet tile.

I. Size: **24 by 24 inches**

J. Applied Soil-Resistance Treatment: Manufacturer's standard material.

K. Antimicrobial Treatment: Manufacturer's standard material.

L. Performance Characteristics: As follows:
1. Wear: Lifetime of carpet warranty.
2. Tuft Bind: Lifetime of carpet warranty.
3. Delamination: Lifetime of carpet warranty.
4. Dimensional Stability: 0.2 percent or less per ISO 2551 (Aachen Test).
5. Antimicrobial Activity: Not less than 2-mm halo of inhibition for gram-positive bacteria; not less than 1-mm halo of inhibition for gram-negative bacteria; no fungal growth; per AATCC 174.
6. Electrostatic Propensity: Less than 3.0 kV per AATCC 134.

2.3 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.

B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.

1. VOC Limits: Provide adhesives with VOC content not more than 50 g/L when calculated according to 40 CFR 59, Subpart D (EPA method 24).

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Comply with CRI 104, Section 14, "Carpet Modules," and with carpet tile manufacturer's written installation instructions.

B. Installation Method: Glue down; install every tile with full-spread, releasable, pressure-sensitive adhesive.

C. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

D. Install pattern: Monolithic (single-directional) front-to-rear of each elevator car, typical.

END OF SECTION 096813

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes surface preparation and the application of paint systems on the following interior substrates:

1. Concrete.
2. Clay masonry.
3. Concrete masonry units (CMU).
4. Steel.
5. Galvanized metal.
6. Aluminum (not anodized or otherwise coated).
7. Wood.
8. Gypsum board.
9. Plaster.
10. Spray-textured ceilings.
11. Cotton or canvas insulation covering.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: For each finish and for each color and texture required.

C. Product List: Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.

D. LEED Submittal:

1. Product Data for Credit EQ 4.2: For paints, including printed statement of VOC content[**and chemical components**].

1.3 QUALITY ASSURANCE

A. MPI Standards:

1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."
2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

B. Mockups: Apply benchmark samples of each paint system indicated and each color and finish selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.

    a. Wall and Ceiling Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
    b. Other Items: Architect will designate items or areas required.

2. Apply benchmark samples after permanent lighting and other environmental services have been activated.
3. Final approval of color selections will be based on benchmark samples.

    a. If preliminary color selections are not approved, apply additional benchmark samples of additional colors selected by Architect at no added cost to Owner.

1.4 EXTRA MATERIALS

A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.

1. Quantity: Furnish an additional [**5**] <**Insert number**> percent, but not less than [**1 gal. (3.8 L)**] <**Insert number**> of each material and color applied.

PART 2 - PRODUCTS

2.1 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. VOC Content of Field-Applied Interior Paints and Coatings: Provide products that comply with the following limits for VOC content, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24); these requirements do not apply to paints and coatings that are applied in a fabrication or finishing shop:

1. Flat Paints, Coatings, and Primers: VOC content of not more than 50 g/L.
2. Nonflat Paints, Coatings, and Primers: VOC content of not more than 150 g/L.
3. Anti-Corrosive and Anti-Rust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.
4. Floor Coatings: VOC not more than 100 g/L.
5. Shellacs, Clear: VOC not more than 730 g/L.
6. Shellacs, Pigmented: VOC not more than 550 g/L.
7. Flat Topcoat Paints: VOC content of not more than 50 g/L.
8. Nonflat Topcoat Paints: VOC content of not more than 150 g/L.

9. Anti-Corrosive and Anti-Rust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.
10. Floor Coatings: VOC not more than 100 g/L.
11. Shellacs, Clear: VOC not more than 730 g/L.
12. Shellacs, Pigmented: VOC not more than 550 g/L.
13. Primers, Sealers, and Undercoaters: VOC content of not more than 200 g/L.
14. Dry-Fog Coatings: VOC content of not more than 400 g/L.
15. Zinc-Rich Industrial Maintenance Primers: VOC content of not more than 340 g/L.
16. Pre-Treatment Wash Primers: VOC content of not more than 420 g/L.

C. Chemical Components of Field-Applied Interior Paints and Coatings: Provide topcoat paints and anti-corrosive and anti-rust paints applied to ferrous metals that comply with the following chemical restrictions; these requirements do not apply to paints and coatings that are applied in a fabrication or finishing shop:

1. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
2. Restricted Components: Paints and coatings shall not contain any of the following:

    a. Acrolein.
    b. Acrylonitrile.
    c. Antimony.
    d. Benzene.
    e. Butyl benzyl phthalate.
    f. Cadmium.
    g. Di (2-ethylhexyl) phthalate.
    h. Di-n-butyl phthalate.
    i. Di-n-octyl phthalate.
    j. 1,2-dichlorobenzene.
    k. Diethyl phthalate.
    l. Dimethyl phthalate.
    m. Ethylbenzene.
    n. Formaldehyde.
    o. Hexavalent chromium.
    p. Isophorone.
    q. Lead.
    r. Mercury.
    s. Methyl ethyl ketone.
    t. Methyl isobutyl ketone.
    u. Methylene chloride.
    v. Naphthalene.
    w. Toluene (methylbenzene).
    x. 1,1,1-trichloroethane.
    y. Vinyl chloride.

D. Colors: [**As selected by Architect from manufacturer's full range**] [**Match Architect's samples**] [**As indicated in a color schedule**] <**Insert requirements**>.

2.2 BLOCK FILLERS

A. Interior/Exterior Latex Block Filler: MPI #4.

1. VOC Content: E Range of [**E2**] [**E3**].

2.3 PRIMERS/SEALERS

A. Interior Latex Primer/Sealer: MPI #50.

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].
2. Environmental Performance Rating: [**EPR 1**] [**EPR 2**] [**EPR 3**].

B. Interior Alkyd Primer/Sealer: MPI #45.

1. VOC Content: E Range of [**E1**] [**E2**].

C. Wood-Knot Sealer: Sealer recommended in writing by topcoat manufacturer for use in paint systems indicated.

2.4 METAL PRIMERS

A. Alkyd Anticorrosive Metal Primer: MPI #79.

1. VOC Content: E Range of [**E1**] [**E2**].

B. Quick-Drying Alkyd Metal Primer: MPI #76.

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].

C. Rust-Inhibitive Primer (Water Based): MPI #107.

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].
2. Environmental Performance Rating: [**EPR 1**] [**EPR 2**] [**EPR 3**].

D. Cementitious Galvanized-Metal Primer: MPI #26.

1. VOC Content: E Range of E1.

E. Waterborne Galvanized-Metal Primer: MPI #134.

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].
2. Environmental Performance Rating: [**EPR 1**] [**EPR 2**] [**EPR 3**].

F. Vinyl Wash Primer: MPI #80.

1. VOC Content: E Range of [**E2**] [**E3**].

G. Quick-Drying Primer for Aluminum: MPI #95.

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].

2.5 WOOD PRIMERS

A. Interior Latex-Based Wood Primer: MPI #39.

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].
2. Environmental Performance Rating: [**EPR 1**] [**EPR 2**] [**EPR 3**].

2.6 LATEX PAINTS

A. Interior Latex (Flat): MPI #53 (Gloss Level 1).

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].
2. Environmental Performance Rating: [**EPR 0.5**] [**EPR 1.5**] [**EPR 2.5**].

B. Interior Latex (Low Sheen): MPI #44 (Gloss Level 2).

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].
2. Environmental Performance Rating: [**EPR 1**] [**EPR 2**] [**EPR 3**].

C. Interior Latex (Eggshell): MPI #52 (Gloss Level 3).

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].
2. Environmental Performance Rating: [**EPR 1**] [**EPR 2**] [**EPR 3**].

D. Interior Latex (Satin): MPI #43 (Gloss Level 4).

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].
2. Environmental Performance Rating: [**EPR 1.5**] [**EPR 2**] [**EPR 2.5**] [**EPR 3.5**].

E. Interior Latex (Semigloss): MPI #54 (Gloss Level 5).

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].
2. Environmental Performance Rating: [**EPR 2**] [**EPR 3**] [**EPR 4**].

F. Interior Latex (Gloss): MPI #114 (Gloss Level 6, except minimum gloss of 65 units at 60 deg).

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].
2. Environmental Performance Rating: [**EPR 2**] [**EPR 3**] [**EPR 4**].

G. Institutional Low-Odor/VOC Latex (Flat): MPI #143 (Gloss Level 1).

1. VOC Content: E Range of E3.
2. Environmental Performance Rating: [**EPR 4**] [**EPR 5.5**].

H. Institutional Low-Odor/VOC Latex (Low Sheen): MPI #144 (Gloss Level 2).

1. VOC Content: E Range of E3.
2. Environmental Performance Rating: EPR 4.5.

I. Institutional Low-Odor/VOC Latex (Eggshell): MPI #145 (Gloss Level 3).

1. VOC Content: E Range of E3.
2. Environmental Performance Rating: EPR 4.5.

J. Institutional Low-Odor/VOC Latex (Semigloss): MPI #147 (Gloss Level 5).

1. VOC Content: E Range of E3.
2. Environmental Performance Rating: [**EPR 3**] [**EPR 5.5**].

K. High-Performance Architectural Latex (Low Sheen): MPI #138 (Gloss Level 2).

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].
2. Environmental Performance Rating: [**EPR 4**] [**EPR 5**] [**EPR 6**].

L. High-Performance Architectural Latex (Eggshell): MPI #139 (Gloss Level 3).

1. VOC Content: E Range of [**E2**] [**E3**].
2. Environmental Performance Rating: [**EPR 5**] [**EPR 6**].

M. High-Performance Architectural Latex (Satin): MPI #140 (Gloss Level 4).

1. VOC Content: E Range of [**E1**] [**E3**].
2. Environmental Performance Rating: [**EPR 4.5**] [**EPR 6.5**].

N. High-Performance Architectural Latex (Semigloss): MPI #141 (Gloss Level 5).

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].
2. Environmental Performance Rating: [**EPR 5**] [**EPR 6**] [**EPR 7**].

O. Exterior Latex (Flat): MPI #10 (Gloss Level 1).

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].

P. Exterior Latex (Semigloss): MPI #11 (Gloss Level 5).

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].

Q. Exterior Latex (Gloss): MPI #119 (Gloss Level 6, except minimum gloss of 65 units at 60 deg).

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].

2.7 ALKYD PAINTS

A. Interior Alkyd (Flat): MPI #49 (Gloss Level 1).

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].

B. Interior Alkyd (Eggshell): MPI #51 (Gloss Level 3).

1. VOC Content: E Range of [**E1**] [**E2**].

C. Interior Alkyd (Semigloss): MPI #47 (Gloss Level 5).

1. VOC Content: E Range of [**E1**] [**E2**].
2. Environmental Performance Rating: [**EPR 1**] [**EPR 2**] [**EPR 3**].

D. Interior Alkyd (Gloss): MPI #48 (Gloss Level 6).

1. VOC Content: E Range of [**E1**] [**E2**].

2.8 QUICK-DRYING ENAMELS

A. Quick-Drying Enamel (Semigloss): MPI #81 (Gloss Level 5).

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].

B. Quick-Drying Enamel (High Gloss): MPI #96 (Gloss Level 7).

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].

2.9 TEXTURED COATING

A. Latex Stucco and Masonry Textured Coating: MPI #42.

1. VOC Content: E Range of [**E2**] [**E3**].

2.10 DRY FOG/FALL COATINGS

A. Latex Dry Fog/Fall: MPI #118.

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].
2. Environmental Performance Rating: [**EPR 1**] [**EPR 2**] [**EPR 3**].

B. Waterborne Dry Fall: MPI #133.

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].
2. Environmental Performance Rating: [**EPR 1**] [**EPR 2**] [**EPR 3**].

C. Interior Alkyd Dry Fog/Fall: MPI #55.

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].

2.11 ALUMINUM PAINT

A. Aluminum Paint: MPI #1.

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].

2.12 FLOOR COATINGS

A. Interior Concrete Floor Stain: MPI #58.

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].
2. Environmental Performance Rating: EPR 2.

B. Interior/Exterior Clear Concrete Floor Sealer (Water Based): MPI #99.

1. VOC Content: E Range of [**E1**] [**E2**] [**E3**].

C. Interior/Exterior Clear Concrete Floor Sealer (Solvent Based): MPI #104.

1. VOC Content: E Range of [**E1**] [**E2**].

D. Interior/Exterior Latex Floor and Porch Paint (Low Gloss): MPI #60 (maximum Gloss Level 3).

1. VOC Content: E Range of [**E2**] [**E3**].
2. Environmental Performance Rating: EPR 3.

E. Exterior/Interior Alkyd Floor Enamel (Gloss): MPI #27 (Gloss Level 6).

1. VOC Content: E Range of [**E1**] [**E2**].
2. Additives: Manufacturer's standard additive to increase skid resistance of painted surface.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.
2. Masonry (Clay and CMU): 12 percent.
3. Wood: 15 percent.
4. Gypsum Board: 12 percent.
5. Plaster: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION AND APPLICATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.

B. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.

C. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

D. Painting Mechanical and Electrical Work: Paint items exposed in equipment rooms and occupied spaces including, but not limited to, the following:

1. Mechanical Work:

a. Uninsulated metal piping.
b. Uninsulated plastic piping.
c. Pipe hangers and supports.
d. Tanks that do not have factory-applied final finishes.
e. Visible portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets.
f. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
g. Mechanical equipment that is indicated to have a factory-primed finish for field painting.
h. <**Insert mechanical items to be painted.**>

2. Electrical Work:

a. Switchgear.
b. Panelboards.
c. Electrical equipment that is indicated to have a factory-primed finish for field painting.
d. <**Insert electrical items to be painted.**>

E. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

F. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.3 INTERIOR PAINTING SCHEDULE

A. Concrete Substrates, Nontraffic Surfaces:

1. Latex System: MPI INT 3.1E.

a. Prime Coat: Interior latex matching topcoat.
b. Intermediate Coat: Interior latex matching topcoat.
c. Topcoat: Interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**] [**(gloss)**].

2. Latex Over Sealer System: MPI INT 3.1A.

a. Prime Coat: Interior latex primer/sealer.
b. Intermediate Coat: Interior latex matching topcoat.
c. Topcoat: Interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**] [**(gloss)**].

3. Latex Over Latex Aggregate System: MPI INT 3.1B.

a. Prime Coat: Latex stucco and masonry textured coating.
b. Intermediate Coat: Exterior latex matching topcoat.
c. Topcoat: Exterior latex [**(flat)**] [**(semigloss)**] [**(gloss)**].

4. Alkyd System: MPI INT 3.1D.

a. Prime Coat: Interior latex primer/sealer.
b. Intermediate Coat: Interior alkyd matching topcoat.
c. Topcoat: Interior alkyd [**(flat)**] [**(eggshell)**] [**(semigloss)**] [**(gloss)**].

5. Institutional Low-Odor/VOC Latex System: MPI INT 3.1M.

a. Prime Coat: Institutional low-odor/VOC interior latex matching topcoat.
b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
c. Topcoat: Institutional low-odor/VOC interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(semigloss)**].

6. High-Performance Architectural Latex System: MPI INT 3.1C.

a. Prime Coat: Interior latex primer/sealer.
b. Intermediate Coat: High-performance architectural latex matching topcoat.
c. Topcoat: High-performance architectural latex [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**].

B. Concrete Substrates, Traffic Surfaces:

1. Latex Floor Enamel System: MPI INT 3.2A.

a. Prime Coat: Interior/exterior latex floor and porch paint (low gloss).
b. Intermediate Coat: Interior/exterior latex floor and porch paint (low gloss).
c. Topcoat: Interior/exterior latex floor and porch paint (low gloss).

2. Alkyd Floor Enamel System: MPI INT 3.2B.

    a. Prime Coat: Exterior/interior alkyd floor enamel (gloss).
    b. Intermediate Coat: Exterior/interior alkyd floor enamel (gloss).
    c. Topcoat: Exterior/interior alkyd floor enamel (gloss).

3. Concrete Stain System: MPI INT 3.2E.

    a. First Coat: Interior concrete floor stain.
    b. Topcoat: Interior concrete floor stain.

4. Clear Sealer System: MPI INT 3.2F.

    a. First Coat: Interior/exterior clear concrete floor sealer (solvent based).
    b. Topcoat: Interior/exterior clear concrete floor sealer (solvent based).

5. Water-Based Clear Sealer System: MPI INT 3.2G.

    a. First Coat: Interior/exterior clear concrete floor sealer (water based).
    b. Topcoat: Interior/exterior clear concrete floor sealer (water based).

C. Clay-Masonry Substrates:

1. Latex System: MPI INT 4.1A.

    a. Prime Coat: Interior latex matching topcoat.
    b. Intermediate Coat: Interior latex matching topcoat.
    c. Topcoat: Interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**] [**(gloss)**].

2. Alkyd System: MPI INT 4.1D.

    a. Prime Coat: Interior latex primer/sealer.
    b. Intermediate Coat: Interior alkyd matching topcoat.
    c. Topcoat: Interior alkyd [**(flat)**] [**(eggshell)**] [**(semigloss)**] [**(gloss)**].

3. Latex Aggregate System: MPI INT 4.1B.

    a. Prime Coat: As recommended in writing by topcoat manufacturer.
    b. Intermediate Coat: As recommended in writing by topcoat manufacturer.
    c. Topcoat: Latex stucco and masonry textured coating.

4. Institutional Low-Odor/VOC Latex System: MPI INT 4.1M.

    a. Prime Coat: Institutional low-odor/VOC interior latex matching topcoat.
    b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
    c. Topcoat: Institutional low-odor/VOC interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(semigloss)**].

5. High-Performance Architectural Latex System: MPI INT 4.1L.

    a. Prime Coat: High-performance architectural latex matching topcoat.

b. Intermediate Coat: High-performance architectural latex matching topcoat.
c. Topcoat: High-performance architectural latex [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**].

D. CMU Substrates:

1. Latex System: MPI INT 4.2A.

a. Prime Coat: Interior/exterior latex block filler.
b. Intermediate Coat: Interior latex matching topcoat.
c. Topcoat: Interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**] [**(gloss)**].

2. Alkyd System: MPI INT 4.2C.

a. Prime Coat: Interior/exterior latex block filler.
b. Intermediate Coat: Interior alkyd matching topcoat.
c. Topcoat: Interior alkyd [**(flat)**] [**(eggshell)**] [**(semigloss)**] [**(gloss)**].

3. Alkyd Over Latex Sealer System: MPI INT 4.2N.

a. Prime Coat: Interior/exterior latex block filler.
b. Sealer Coat: Interior latex primer/sealer.
c. Intermediate Coat: Interior alkyd matching topcoat.
d. Topcoat: Interior alkyd [**(flat)**] [**(eggshell)**] [**(semigloss)**] [**(gloss)**].

4. Institutional Low-Odor/VOC Latex System: MPI INT 4.2E.

a. Prime Coat: Interior/exterior latex block filler.
b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
c. Topcoat: Institutional low-odor/VOC interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(semigloss)**].

5. High-Performance Architectural Latex System: MPI INT 4.2D.

a. Prime Coat: Interior/exterior latex block filler.
b. Intermediate Coat: High-performance architectural latex matching topcoat.
c. Topcoat: High-performance architectural latex [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**].

E. Steel Substrates:

1. Quick-Drying Enamel System: MPI INT 5.1A.

a. Prime Coat: Quick-drying alkyd metal primer.
b. Intermediate Coat: Quick-drying enamel matching topcoat.
c. Topcoat: Quick-drying enamel [**(semigloss)**] [**(high gloss)**].

2. Water-Based Dry-Fall System: MPI INT 5.1C.

a. Prime Coat: [**Alkyd anticorrosive**] [**Quick-drying alkyd**] metal primer.
b. Topcoat: [**Latex dry fog/fall**] [**Waterborne dry fall**].

3. Alkyd Dry-Fall System: MPI INT 5.1D.

    a. Prime Coat: [**Alkyd anticorrosive**] [**Quick-drying alkyd**] metal primer.
    b. Topcoat: Interior alkyd dry fog/fall.

4. Latex Over Alkyd Primer System: MPI INT 5.1Q.

    a. Prime Coat: [**Alkyd anticorrosive**] [**Quick-drying alkyd**] metal primer.
    b. Intermediate Coat: Interior latex matching topcoat.
    c. Topcoat: Interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**] [**(gloss)**].

5. Alkyd System: MPI INT 5.1E.

    a. Prime Coat: [**Alkyd anticorrosive**] [**Quick-drying alkyd**] metal primer.
    b. Intermediate Coat: Interior alkyd matching topcoat.
    c. Topcoat: Interior alkyd [**(flat)**] [**(eggshell)**] [**(semigloss)**] [**(gloss)**].

6. Aluminum Paint System: MPI INT 5.1M.

    a. Prime Coat: [**Alkyd anticorrosive**] [**Quick-drying alkyd**] metal primer.
    b. Intermediate Coat: Aluminum paint.
    c. Topcoat: Aluminum paint.

7. Institutional Low-Odor/VOC Latex System: MPI INT 5.1S.

    a. Prime Coat: Rust-inhibitive primer (water based).
    b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
    c. Topcoat: Institutional low-odor/VOC interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(semigloss)**].

8. High-Performance Architectural Latex System: MPI INT 5.1R.

    a. Prime Coat: [**Alkyd anticorrosive**] [**Quick-drying alkyd**] metal primer.
    b. Intermediate Coat: High-performance architectural latex matching topcoat.
    c. Topcoat: High-performance architectural latex [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**].

F. Galvanized-Metal Substrates:

1. Water-Based Dry-Fall System: MPI INT 5.3H.

    a. Prime Coat: Waterborne dry fall.
    b. Topcoat: Waterborne dry fall.

2. Alkyd Dry-Fall System: MPI INT 5.3F.

    a. Prime Coat: Cementitious galvanized-metal primer.
    b. Topcoat: Interior alkyd dry fog/fall.

3. Latex System: MPI INT 5.3A.

a. Prime Coat: Cementitious galvanized-metal primer.
b. Intermediate Coat: Interior latex matching topcoat.
c. Topcoat: Interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**] [**(gloss)**].

4. Latex Over Waterborne Primer System: MPI INT 5.3J.

a. Prime Coat: Waterborne galvanized-metal primer.
b. Intermediate Coat: Interior latex matching topcoat.
c. Topcoat: Interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**] [**(gloss)**].

5. Alkyd System: MPI INT 5.3C.

a. Prime Coat: Cementitious galvanized-metal primer.
b. Intermediate Coat: Interior alkyd matching topcoat.
c. Topcoat: Interior alkyd [**(flat)**] [**(eggshell)**] [**(semigloss)**] [**(gloss)**].

6. Aluminum Paint System: MPI INT 5.3G.

a. Prime Coat: Cementitious galvanized-metal primer.
b. Intermediate Coat: Aluminum paint.
c. Topcoat: Aluminum paint.

7. Institutional Low-Odor/VOC Latex System: MPI INT 5.3N.

a. Prime Coat: Waterborne galvanized-metal primer.
b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
c. Topcoat: Institutional low-odor/VOC interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(semigloss)**].

8. High-Performance Architectural Latex System: MPI INT 5.3M.

a. Prime Coat: Waterborne galvanized-metal primer.
b. Intermediate Coat: High-performance architectural latex matching topcoat.
c. Topcoat: High-performance architectural latex [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**].

G. Aluminum (Not Anodized or Otherwise Coated) Substrates:

1. Latex System: MPI INT 5.4H.

a. Prime Coat: Quick-drying primer for aluminum.
b. Intermediate Coat: Interior latex matching topcoat.
c. Topcoat: Interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**] [**(gloss)**].

2. Alkyd Over Vinyl Wash Primer System: MPI INT 5.4A.

a. Prime Coat: Vinyl wash primer.
b. Intermediate Coat: Interior alkyd matching topcoat.

c. Topcoat: Interior alkyd [**(flat)**] [**(eggshell)**] [**(semigloss)**] [**(gloss)**].

3. Alkyd Over Quick-Drying Primer System: MPI INT 5.4J.

a. Prime Coat: Quick-drying primer for aluminum.
b. Intermediate Coat: Interior alkyd matching topcoat.
c. Topcoat: Interior alkyd [**(flat**] [**(eggshell)**] [**(semigloss)**] [**(gloss)**].

4. Aluminum Paint System: MPI INT 5.4D.

a. Prime Coat: Vinyl wash primer.
b. Intermediate Coat: Aluminum paint.
c. Topcoat: Aluminum paint.

5. Institutional Low-Odor/VOC Latex System: MPI INT 5.4G.

a. Prime Coat: Quick-drying primer for aluminum.
b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
c. Topcoat: Institutional low-odor/VOC interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(semigloss)**].

6. High-Performance Architectural Latex System: MPI INT 5.4F.

a. Prime Coat: Quick-drying primer for aluminum.
b. Intermediate Coat: High-performance architectural latex matching topcoat.
c. Topcoat: High-performance architectural latex [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**].

H. Glue-Laminated Beam and Column Substrates:

1. Latex System: MPI INT 6.1M.

a. Prime Coat: Interior latex-based wood primer.
b. Intermediate Coat: Interior latex matching topcoat.
c. Topcoat: Interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**] [**(gloss)**].

2. Latex Over Alkyd Primer System: MPI INT 6.1A.

a. Prime Coat: Interior alkyd primer/sealer.
b. Intermediate Coat: Interior latex matching topcoat.
c. Topcoat: Interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**] [**(gloss)**].

3. Alkyd System: MPI INT 6.1B.

a. Prime Coat: Interior alkyd primer/sealer.
b. Intermediate Coat: Interior alkyd matching topcoat.
c. Topcoat: Interior alkyd [**(flat)**] [**(eggshell)**] [**(semigloss)**] [**(gloss)**].

4. Institutional Low-Odor/VOC Latex System: MPI INT 6.1Q.

a. Prime Coat: Interior latex-based wood primer.
b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
c. Topcoat: Institutional low-odor/VOC interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(semigloss)**].

5. High-Performance Architectural Latex System: MPI INT 6.1N.

a. Prime Coat: Interior latex-based wood primer.
b. Intermediate Coat: High-performance architectural latex matching topcoat.
c. Topcoat: High-performance architectural latex [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**].

I. Dressed Lumber Substrates: Including [**architectural woodwork**] [**doors**] <**Insert description**>.

1. Latex System: MPI INT 6.3T.

a. Prime Coat: Interior latex-based wood primer.
b. Intermediate Coat: Interior latex matching topcoat.
c. Topcoat: Interior latex [**(semigloss)**] [**(gloss)**].

2. Latex Over Alkyd Primer System: MPI INT 6.3U.

a. Prime Coat: Interior alkyd primer/sealer.
b. Intermediate Coat: Interior latex matching topcoat.
c. Topcoat: Interior latex [**(semigloss)**] [**(gloss)**].

3. Alkyd System: MPI INT 6.3B.

a. Prime Coat: Interior alkyd primer/sealer.
b. Intermediate Coat: Interior alkyd matching topcoat.
c. Topcoat: Interior alkyd [**(eggshell)**] [**(semigloss)**] [**(gloss)**].

4. Institutional Low-Odor/VOC Latex System: MPI INT 6.3V.

a. Prime Coat: Interior latex-based wood primer.
b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
c. Topcoat: Institutional low-odor/VOC interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(semigloss)**].

5. High-Performance Architectural Latex System: MPI INT 6.3A.

a. Prime Coat: Interior latex-based wood primer.
b. Intermediate Coat: High-performance architectural latex matching topcoat.
c. Topcoat: High-performance architectural latex [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**].

J. Wood Panel Substrates: Including [**painted plywood**] [**medium-density fiberboard**] [**hardboard**] <**Insert description**>.

1. Latex System: MPI INT 6.4R.

a. Prime Coat: Interior latex-based wood primer.
b. Intermediate Coat: Interior latex matching topcoat.
c. Topcoat: Interior latex [**(semigloss)**] [**(gloss)**].

2. Latex Over Alkyd Primer System: MPI INT 6.4A.

a. Prime Coat: Interior alkyd primer/sealer.
b. Intermediate Coat: Interior latex matching topcoat.
c. Topcoat: Interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**] [**(gloss)**].

3. Alkyd System: MPI INT 6.4B.

a. Prime Coat: Interior alkyd primer/sealer.
b. Intermediate Coat: Interior alkyd matching topcoat.
c. Topcoat: Interior alkyd [**(flat)**] [**(eggshell)**] [**(semigloss)**] [**(gloss)**].

4. Institutional Low-Odor/VOC Latex System: MPI INT 6.4T.

a. Prime Coat: Interior latex-based wood primer.
b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
c. Topcoat: Institutional low-odor/VOC interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(semigloss)**].

5. High-Performance Architectural Latex System: MPI INT 6.4S.

a. Prime Coat: Interior latex-based wood primer.
b. Intermediate Coat: High-performance architectural latex matching topcoat.
c. Topcoat: High-performance architectural latex [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**].

K. Dimension Lumber Substrates, Nontraffic Surfaces: Including [**exposed joists**] [**exposed beams**] <**Insert description**>.

1. Latex System: MPI INT 6.2D.

a. Prime Coat: Interior latex-based wood primer.
b. Intermediate Coat: Interior latex matching topcoat.
c. Topcoat: Interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**] [**(gloss)**].

2. Latex Over Alkyd Primer System: MPI INT 6.2A.

a. Prime Coat: Interior alkyd primer/sealer.
b. Intermediate Coat: Interior latex matching topcoat.
c. Topcoat: Interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**] [**(gloss)**].

3. Alkyd System: MPI INT 6.2C.

a. Prime Coat: Interior alkyd primer/sealer.

b. Intermediate Coat: Interior alkyd matching topcoat.
c. Topcoat: Interior alkyd [**(flat)**] [**(eggshell)**] [**(semigloss)**] [**(gloss)**].

4. Institutional Low-Odor/VOC Latex System: MPI INT 6.2L.

a. Prime Coat: Interior latex-based wood primer.
b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
c. Topcoat: Institutional low-odor/VOC interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(semigloss)**].

5. High-Performance Architectural Latex System: MPI INT 6.2B.

a. Prime Coat: Interior alkyd primer/sealer.
b. Intermediate Coat: High-performance architectural latex matching topcoat.
c. Topcoat: High-performance architectural latex [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**].

L. Wood Substrates, Traffic Surfaces:

1. Latex Floor Paint System: MPI INT 6.5G.

a. Prime Coat: Interior alkyd primer/sealer.
b. Intermediate Coat: Interior/exterior latex floor and porch paint (low gloss).
c. Topcoat: Interior/exterior latex floor and porch paint (low gloss).

2. Alkyd Floor Enamel System: MPI INT 6.5A.

a. Prime Coat: Exterior/interior alkyd floor enamel (gloss).
b. Intermediate Coat: Exterior/interior alkyd floor enamel (gloss).
c. Topcoat: Exterior/interior alkyd floor enamel (gloss).

M. Gypsum Board Substrates:

1. Latex System: MPI INT 9.2A.

a. Prime Coat: Interior latex [**primer/sealer**] [**matching topcoat**].
b. Intermediate Coat: Interior latex matching topcoat.
c. Topcoat: Interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**] [**(gloss)**].

2. Alkyd Over Latex Primer System: MPI INT 9.2C.

a. Prime Coat: Interior latex primer/sealer.
b. Intermediate Coat: Interior alkyd matching topcoat.
c. Topcoat: Interior alkyd [**(flat)**] [**(eggshell)**] [**(semigloss)**] [**(gloss)**].

3. Institutional Low-Odor/VOC Latex System: MPI INT 9.2M.

a. Prime Coat: Interior latex primer/sealer.
b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
c. Topcoat: Institutional low-odor/VOC interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(semigloss)**].

4. High-Performance Architectural Latex System: MPI INT 9.2B.

    a. Prime Coat: Interior latex primer/sealer.
    b. Intermediate Coat: High-performance architectural latex matching topcoat.
    c. Topcoat: High-performance architectural latex [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**].

N. Plaster Substrates:

1. Latex System: MPI INT 9.2A.

    a. Prime Coat: Interior latex [**primer/sealer**] [**matching topcoat**].
    b. Intermediate Coat: Interior latex matching topcoat.
    c. Topcoat: Interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**] [**(gloss)**].

2. Latex Over Alkyd Primer System: MPI INT 9.2K.

    a. Prime Coat: Interior alkyd primer/sealer.
    b. Intermediate Coat: Interior latex matching topcoat.
    c. Topcoat: Interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**] [**(gloss)**].

3. Alkyd Over Latex Primer System: MPI INT 9.2C.

    a. Prime Coat: Interior latex primer/sealer.
    b. Intermediate Coat: Interior alkyd matching topcoat.
    c. Topcoat: Interior alkyd [**(flat)**] [**(eggshell)**] [**(semigloss)**] [**(gloss)**].

4. Institutional Low-Odor/VOC Latex System: MPI INT 9.2M.

    a. Prime Coat: Interior latex primer/sealer.
    b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
    c. Topcoat: Institutional low-odor/VOC interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(semigloss)**].

5. High-Performance Architectural Latex System: MPI INT 9.2B.

    a. Prime Coat: Interior latex primer/sealer.
    b. Intermediate Coat: High-performance architectural latex matching topcoat.
    c. Topcoat: High-performance architectural latex [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**].

O. Spray-Textured Ceiling Substrates:

1. Latex (Flat) System: MPI INT 9.1A, spray applied.

    a. Prime Coat: Interior latex [**primer/sealer**] [**(flat)**].
    b. Topcoat: Interior latex (flat).

2. Latex System: MPI INT 9.1E, spray applied.

a. Prime Coat: Interior latex matching topcoat.
b. Intermediate Coat: Interior latex matching topcoat.
c. Topcoat: Interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**].

3. Latex Over Alkyd Primer System: MPI INT 9.1B.

a. Prime Coat: Interior alkyd primer/sealer.
b. Topcoat: Interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**] [**(gloss)**].

4. Alkyd (Flat) System: MPI INT 9.1C.

a. Prime Coat: Interior alkyd (flat).
b. Topcoat: Interior alkyd (flat).

5. Alkyd System: MPI INT 9.1D.

a. Prime Coat: Interior alkyd primer/sealer.
b. Intermediate Coat: Interior alkyd matching topcoat.
c. Topcoat: Interior alkyd [**(eggshell)**] [**(semigloss)**] [**(gloss)**].

P. Cotton or Canvas Insulation-Covering Substrates: Including [**pipe and duct coverings**] <**Insert description**>.

1. Latex System: MPI INT 10.1A.

a. Prime Coat: Interior latex [**primer/sealer**] [**matching topcoat**].
b. Intermediate Coat: Interior latex matching topcoat.
c. Topcoat: Interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(satin)**] [**(semigloss)**] [**(gloss)**].

2. Alkyd Over Latex Primer System: MPI INT 10.1B.

a. Prime Coat: Interior latex primer/sealer.
b. Intermediate Coat: Interior alkyd matching topcoat.
c. Topcoat: Interior alkyd [**(flat)**] [**(eggshell)**] [**(semigloss)**] [**(gloss)**].

3. Aluminum Paint System: MPI INT 10.1C.

a. Prime Coat: Interior latex primer/sealer.
b. Intermediate Coat: Aluminum paint.
c. Topcoat: Aluminum paint.

4. Institutional Low-Odor/VOC Latex System: MPI INT 10.1D.

a. Prime Coat: Interior latex primer/sealer.
b. Intermediate Coat: Institutional low-odor/VOC interior latex matching topcoat.
c. Topcoat: Institutional low-odor/VOC interior latex [**(flat)**] [**(low sheen)**] [**(eggshell)**] [**(semigloss)**].

END OF SECTION 099123

SECTION 102600 - WALL AND DOOR PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Wall guards.
2. Impact-resistant handrails.
3. Bed locators.
4. Corner guards.
5. Impact-resistant wall coverings.
6. Door-protection systems.

B. See Division 08 Section "Door Hardware" for metal armor, kick, mop, and push plates.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Include sections, details, and attachments to other work.

C. Samples: For each type of unit and for each color and texture required.

D. LEED Submittal:

1. Product Data for Credit EQ 4.1: For adhesives, including printed statement of VOC content.

E. Maintenance data.

1.3 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Provide impact-resistant, plastic wall-protection units with surface-burning characteristics as determined by testing identical products per ASTM E 84, NFPA 255, or UL 723 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store plastic wall-protection components for a minimum of 72 hours, or until plastic material attains a minimum room temperature of 70 deg F (21 deg C).

1.5 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of impact-resistant wall-protection units that fail in materials or workmanship within specified warranty period.

1. Warranty Period: [**Five**] <**Insert number**> years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.
3. Basis-of-Design Product: The design for each impact-resistant wall-protection unit is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified.

2.2 MATERIALS

A. Extruded Rigid Plastic: High-impact-resistant PVC or acrylic-modified vinyl plastic with integral color throughout.

B. Plastic Sheet Wall Covering Material: Semirigid, high-impact-resistant PVC or acrylic-modified vinyl plastic sheet with integral color throughout.

C. Aluminum Extrusions: ASTM B 221 (ASTM B 221M).

D. Stainless-Steel Sheet: ASTM A 240/A 240M.

E. Fasteners: Aluminum, nonmagnetic stainless steel, or other noncorrosive metal; security-type where exposed to view.

F. Adhesive: Type recommended by manufacturer for use with material being adhered to substrate indicated.

1. Use adhesives and sealants that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

a. Gypsum Board and Panel Adhesives: 50 g/L.
b. Multipurpose Construction Adhesives: 70 g/L.
c. Contact Adhesive: 80 g/L.

2.3 WALL GUARDS

A. Crash Rail <**Insert drawing designation**>: Heavy-duty assembly consisting of continuous snap-on plastic cover installed over continuous retainer; with continuous rubber or vinyl bumper cushion(s) centered in the retainer; designed to withstand impacts.

1. Basis-of-Design Product: <**Insert manufacturer's name; product name or designation**> or a comparable product by one of the following:
2. [**Available**]Manufacturers:

a. American Floor Products Co., Inc.
b. ARDEN Architectural Specialties, Inc.
c. Balco, Inc.
d. Construction Specialties, Inc.
e. IPC Door and Wall Protection Systems; Division of InPro Corporation.
f. Korogard Wall Protection Systems; Division of RJF International Corporation.
g. Pawling Corporation.
h. Tepromark International, Inc.
i. <**Insert manufacturer's name.**>

3. Cover: Extruded rigid plastic, minimum 0.100-inch (2.5-mm) wall thickness; [**as follows:**] [**in dimensions and profiles indicated on Drawings.**]

a. Profile: Flat profile, nominal [**4 inches high by 1 inch (100 mm high by 25 mm)**] [**6 inches high by 1 inch (150 mm high by 25 mm)**] [**8 inches high by 1 inch (200 mm high by 25 mm)**] <**Insert dimensions**> deep.
b. Color and Texture: [**As indicated by manufacturer's designations**] [**As selected by Architect from manufacturer's full range**].

4. Retainer: Minimum 0.080-inch- (2.0-mm-) thick, 1-piece, extruded aluminum.

a. Mounting: [**Surface mounted directly to wall**] [**Surface mounted on 1/2-inch-(13-mm-) thick cushion spacers**] [**Extended mounting on injection-molded plastic mounting brackets**].

5. End Caps and Corners: Prefabricated, injection-molded plastic; color matching cover; field adjustable for close alignment with snap-on cover.
6. Accessories: Concealed splices and mounting hardware.

B. Bumper Rail <**Insert drawing designation**>: Assembly consisting of continuous snap-on plastic cover installed over continuous retainer; designed to spring back when hit.

1. Basis-of-Design Product: <**Insert manufacturer's name; product name or designation**> or a comparable product by one of the following:
2. [**Available**]Manufacturers:

a. American Floor Products Co., Inc.
b. ARDEN Architectural Specialties, Inc.
c. Balco, Inc.
d. Boston Retail Products.
e. Construction Specialties, Inc.

f. IPC Door and Wall Protection Systems; Division of InPro Corporation.
g. Korogard Wall Protection Systems; Division of RJF International Corporation.
h. Pawling Corporation.
i. Tepromark International, Inc.
j. <**Insert manufacturer's name.**>

3. Cover: Extruded rigid plastic, minimum 0.078-inch (2.0-mm) wall thickness; [**as follows:**] [**in dimensions and profiles indicated on Drawings.**]

a. Profile: [**Large rounded bullnose profile, nominal 4 inches high by 2 inches (100 mm high by 50 mm)**] [**Flat profile, nominal 4 inches high by 1 inch (100 mm high by 25 mm)**] <**Insert profile and dimensions**> deep.
b. Color and Texture: [**As indicated by manufacturer's designations**] [**As selected by Architect from manufacturer's full range**].

4. Retainer: Minimum 0.0625-inch- (1.6-mm-) thick, 1-piece, extruded aluminum.

a. Mounting: [**Surface mounted directly to wall**] [**Surface mounted on 1/2-inch- (13-mm-) thick cushion spacers**] [**Extended mounting on injection-molded plastic mounting brackets**].

5. End Caps and Corners: Prefabricated, injection-molded plastic; color matching cover; field adjustable for close alignment with snap-on cover.
6. Accessories: Concealed splices and mounting hardware.

C. Rub Rail <**Insert drawing designation**>: Assembly consisting of continuous snap-on cover installed over continuous retainer.

1. Basis-of-Design Product: <**Insert manufacturer's name; product name or designation**> or a comparable product by one of the following:
2. [**Available**]Manufacturers:

a. American Floor Products Co., Inc.
b. ARDEN Architectural Specialties, Inc.
c. Balco, Inc.
d. Boston Retail Products.
e. Construction Specialties, Inc.
f. IPC Door and Wall Protection Systems; Division of InPro Corporation.
g. Pawling Corporation.
h. Tepromark International, Inc.
i. <**Insert manufacturer's name.**>

3. Cover: Extruded [**rigid plastic**] [**flexible vinyl**], minimum 0.078-inch (2.0-mm) wall thickness; [**as follows:**] [**in dimensions and profiles indicated on Drawings.**]

a. Profile: [**Half-round profile, nominal 2 inches high by 1 inch (50 mm high by 25 mm)**] [**Small rounded profile, nominal 1-1/8 inches high by 1-1/8 inches (30 mm high by 30 mm)**] <**Insert profile and dimensions**> deep.
b. Color and Texture: [**As indicated by manufacturer's designations**] [**As selected by Architect from manufacturer's full range**].

4. Retainer: Minimum 0.0625-inch- (1.6-mm-) thick, 1-piece, extruded aluminum.

   a. Mounting: Surface mounted [**directly to wall**] [**on 1/2-inch- (13-mm-) thick cushion spacers**].

5. End Caps and Corners: Prefabricated, injection-molded plastic; color matching cover; field adjustable for close alignment with snap-on cover.
6. Accessories: Concealed splices and mounting hardware.

D. Opaque-Plastic Chair Rail <**Insert drawing designation**>: Assembly consisting of continuous snap-on cover installed over continuous retainer.

1. Basis-of-Design Product: <**Insert manufacturer's name; product name or designation**> or a comparable product by one of the following:
2. [**Available**]Manufacturers:

   a. Construction Specialties, Inc.
   b. IPC Door and Wall Protection Systems; Division of InPro Corporation.
   c. <**Insert manufacturer's name.**>

3. Cover: Extruded rigid plastic, minimum 0.070-inch (1.8-mm) wall thickness; [**as follows:**] [**in dimensions and profiles indicated on Drawings.**]

   a. Profile: [**Half-round profile, nominal 2 inches high by 1 inch (50 mm high by 25 mm)**] [**Small rounded profile, nominal 1-1/8 inches high by 1-1/8 inches (30 mm high by 30 mm)**] <**Insert profile and dimensions**> deep.
   b. Color and Texture: [**As indicated by manufacturer's designations**] [**As selected by Architect from manufacturer's full range**].

4. Retainer: Minimum 0.060-inch- (1.5-mm-) thick, 1-piece, extruded aluminum.

   a. Mounting: Surface mounted [**directly to wall**] [**on 1/2-inch- (13-mm-) thick cushion spacers**].

5. End Caps and Corners: Prefabricated, injection-molded plastic; color matching cover; field adjustable for close alignment with snap-on cover.
6. Accessories: Concealed splices and mounting hardware.

2.4 HANDRAILS

A. Impact-Resistant Plastic Handrails <**Insert drawing designation**>: Assembly consisting of snap-on plastic cover installed over continuous retainer.

1. Basis-of-Design Product: <**Insert manufacturer's name; product name or designation**> or a comparable product by one of the following:
2. [**Available**]Manufacturers:

   a. American Floor Products Co., Inc.
   b. ARDEN Architectural Specialties, Inc.
   c. Balco, Inc.

d. Construction Specialties, Inc.
e. IPC Door and Wall Protection Systems; Division of InPro Corporation.
f. Korogard Wall Protection Systems; Division of RJF International Corporation.
g. Pawling Corporation.
h. Tepromark International, Inc.
i. <**Insert manufacturer's name.**>

3. Cover: Minimum [**0.078-inch- (2.0-mm-)**] [**0.100-inch- (2.5-mm-)**] thick, extruded rigid plastic; [**as follows:**] [**in dimensions and profiles indicated on Drawings.**]

a. Single Handrail Profile: 1-1/2-inch- (38-mm-) diameter tube with continuous retainer; with 2-inch- (50-mm-) wide mounting brackets supporting bottom of rail.
b. Flat Bumper-Rail Profile: Nominal 5-1/2-inch- (140-mm-) high by 1-1/2-inch- (38-mm-) deep bumper rail with flat front side; with 1-1/2-inch- (38-mm-) diameter gripping surface and finger recess on back side; with continuous rubber or vinyl bumper cushion(s) centered in the extrusion; supported by continuous retainer and extended mounting brackets.
c. Angled-Front Bumper-Rail Profile: Nominal 5-1/2-inch- (140-mm-) high by 2-inch- (50-mm-) deep bumper rail with angled front side; with 1-1/2-inch- (38-mm-) diameter gripping surface and finger recess on back side; supported by continuous retainer and extended mounting brackets.
d. Color and Texture: [**As indicated by manufacturer's designations**] [**As selected by Architect from manufacturer's full range**].

4. Retainer: Minimum 0.080-inch- (2.0-mm-) thick, 1-piece, extruded aluminum.
5. Mounting Bracket: Extended mounting on [**injection-molded, plastic**] [**anodized-aluminum**] mounting brackets.
6. End Caps and Corners: Prefabricated, injection-molded plastic; color matching cover; field adjustable for close alignment with snap-on cover.
7. Accessories: Concealed splices, cushions, and mounting hardware.

2.5 BED LOCATORS

A. Bed Locators <**Insert drawing designation**>: Assembly consisting of continuous snap-on plastic cover installed over continuous retainer; with two bed-locator end caps and mounting hardware; cover designed to spring back when hit.

1. Basis-of-Design Product: <**Insert manufacturer's name; product name or designation**> or a comparable product by one of the following:
2. [**Available**]Manufacturers:

a. American Floor Products Co., Inc.
b. ARDEN Architectural Specialties, Inc.
c. Construction Specialties, Inc.
d. IPC Door and Wall Protection Systems; Division of InPro Corporation.
e. Korogard Wall Protection Systems; Division of RJF International Corporation.
f. Pawling Corporation.
g. <**Insert manufacturer's name.**>

3. Cover: Extruded rigid plastic, minimum 0.078-inch (2.0-mm) wall thickness.

a. Profile: Large rounded bullnose profile, nominal 4 inches high by 2 inches (100 mm high by 50 mm) deep.
b. Color and Texture: [**As indicated by manufacturer's designations**] [**As selected by Architect from manufacturer's full range**].

4. Retainer: Minimum 0.080-inch- (2.0-mm-) thick, 1-piece, extruded aluminum.

a. Mounting Type: [**Surface mounted on 1/2-inch- (13-mm-) thick cushion spacers**] [**Extended mounting on injection-molded plastic mounting brackets**] [**Extended mounting on aluminum mounting brackets**].

5. Bed-Locator End Caps: Prefabricated, injection-molded plastic; color matching cover; field adjustable for close alignment with snap-on cover.

2.6 CORNER GUARDS

A. Surface-Mounted, Resilient, Plastic Corner Guards <**Insert drawing designation**>: Assembly consisting of snap-on plastic cover installed over continuous retainer; including mounting hardware; fabricated with 90- or 135-degree turn to match wall condition.

1. Basis-of-Design Product: <**Insert manufacturer's name; product name or designation**> or a comparable product by one of the following:
2. [**Available**]Manufacturers:

a. American Floor Products Co., Inc.
b. ARDEN Architectural Specialties, Inc.
c. Balco, Inc.
d. Construction Specialties, Inc.
e. IPC Door and Wall Protection Systems; Division of InPro Corporation.
f. Korogard Wall Protection Systems; Division of RJF International Corporation.
g. Pawling Corporation.
h. Tepromark International, Inc.
i. <**Insert manufacturer's name.**>

3. Cover: Extruded rigid plastic, minimum [**0.078-inch (2.0-mm)**] [**0.100-inch (2.5-mm)**] wall thickness; [**as follows:**] [**in dimensions and profiles indicated on Drawings.**]

a. Profile: Nominal [**2-inch- (50-mm-) long leg and 1/4-inch (6-mm)**] [**3-inch- (75-mm-) long leg and 1/4-inch (6-mm)**] [**3-inch- (75-mm-) long leg and 1-1/4-inch (32-mm)**] corner radius.
b. Height: [**4 feet (1.2 m)**] [**8 feet (2.4 m)**] <**Insert dimension**>.
c. Color and Texture: [**As indicated by manufacturer's designations**] [**As selected by Architect from manufacturer's full range**].

4. Retainer: Minimum 0.060-inch- (1.5-mm-) thick, 1-piece, extruded aluminum.
5. Top and Bottom Caps: Prefabricated, injection-molded plastic; color matching cover; field adjustable for close alignment with snap-on cover.

B. Flush-Mounted, Resilient, Plastic Corner Guards <**Insert drawing designation**>: Assembly consisting of snap-on, plastic cover that is flush with adjacent wall surface, installed over

continuous retainer; including mounting hardware; fabricated with 90- or 135-degree turn to match wall condition; full wall height.

1. Basis-of-Design Product: <**Insert manufacturer's name; product name or designation**> or a comparable product by one of the following:
2. [**Available**]Manufacturers:

    a. American Floor Products Co., Inc.
    b. ARDEN Architectural Specialties, Inc.
    c. Balco, Inc.
    d. Construction Specialties, Inc.
    e. IPC Door and Wall Protection Systems; Division of InPro Corporation.
    f. Korogard Wall Protection Systems; Division of RJF International Corporation.
    g. Pawling Corporation.
    h. <**Insert manufacturer's name.**>

3. Cover: Extruded rigid plastic, minimum [**0.078-inch (2.0-mm)**] [**0.100-inch (2.5-mm)**] wall thickness; [**as follows:**] [**in dimensions and profiles indicated on Drawings.**]

    a. Profile: Nominal [**2-inch- (50-mm-) long leg and 1/4-inch (6-mm)**] [**3-inch- (75-mm-) long leg and 1/4-inch (6-mm)**] [**3-inch- (75-mm-) long leg and 1-1/4-inch (32-mm)**] corner radius.
    b. Height: [**4 feet (1.2 m)**] [**8 feet (2.4 m)**] <**Insert dimension**>.
    c. Color and Texture: [**As indicated by manufacturer's designations**] [**As selected by Architect from manufacturer's full range**].

4. Retainer: Minimum 0.060-inch- (1.5-mm-) thick, 1-piece, extruded aluminum.

C. Fire-Rated, Resilient, Plastic Corner Guards <**Insert drawing designation**>: Assembly consisting of snap-on, plastic cover that is flush with adjacent wall surface, installed over continuous retainer and intumescent fire barrier; including mounting hardware; fabricated with 90- or 135-degree turn to match wall condition; full wall height.

1. Basis-of-Design Product: <**Insert manufacturer's name; product name or designation**> or a comparable product by one of the following:
2. [**Available**]Manufacturers:

    a. American Floor Products Co., Inc.
    b. ARDEN Architectural Specialties, Inc.
    c. Balco, Inc.
    d. Construction Specialties, Inc.
    e. IPC Door and Wall Protection Systems; Division of InPro Corporation.
    f. Korogard Wall Protection Systems; Division of RJF International Corporation.
    g. Pawling Corporation.
    h. <**Insert manufacturer's name.**>

3. Fire Rating: [**1 hour**] [**2 hours**] [**Same rating as wall in which corner guard is installed**]; UL listed and labeled according to UL 2079.
4. Cover: Extruded rigid plastic, minimum [**0.078-inch (2.0-mm)**] [**0.100-inch (2.5-mm)**] wall thickness; [**as follows:**] [**in dimensions and profiles indicated on Drawings.**]

a. Leg: Nominal [**2 inches (50 mm)**] [**3 inches (75 mm)**].
b. Corner Radius: [**1/4 inch (6 mm)**] [**1-1/4 inches (32 mm)**].
c. Color and Texture: [**As indicated by manufacturer's designations**] [**As selected by Architect from manufacturer's full range**].

5. Retainer: Minimum 0.070-inch- (1.8-mm-) thick, 1-piece, extruded aluminum.

D. Surface-Mounted, Opaque-Plastic Corner Guards <**Insert drawing designation**>: Fabricated from PVC plastic, acrylic-modified vinyl sheet or opaque polycarbonate sheet; with formed edges; fabricated with 90- or 135-degree turn to match wall condition.

1. Basis-of-Design Product: <**Insert manufacturer's name; product name or designation**> or a comparable product by one of the following:
2. [**Available**]Manufacturers:

a. American Floor Products Co., Inc.
b. ARDEN Architectural Specialties, Inc.
c. Balco, Inc.
d. Boston Retail Products.
e. Construction Specialties, Inc.
f. IPC Door and Wall Protection Systems; Division of InPro Corporation.
g. Korogard Wall Protection Systems; Division of RJF International Corporation.
h. Pawling Corporation.
i. Tepromark International, Inc.
j. <**Insert manufacturer's name.**>

3. Wing Size: Nominal [**3/4 by 3/4 inch (20 by 20 mm)**] [**1-1/8 by 1-1/8 inches (30 by 30 mm)**] [**2-1/2 by 2-1/2 inches (65 by 65 mm)**].
4. Mounting: [**Countersunk screws through factory-drilled mounting holes**] [**Adhesive**] [**Double-faced adhesive foam tape**].
5. Color and Texture: [**As indicated by manufacturer's designations**] [**As selected by Architect from manufacturer's full range**].

E. Surface-Mounted, Metal Corner Guards <**Insert drawing designation**>: Fabricated from 1-piece, formed or extruded metal with formed edges; with 90- or 135-degree turn to match wall condition.

1. Basis-of-Design Product: <**Insert manufacturer's name; product name or designation**> or a comparable product by one of the following:
2. [**Available**]Manufacturers:

a. American Floor Products Co., Inc.
b. ARDEN Architectural Specialties, Inc.
c. Balco, Inc.
d. Boston Retail Products.
e. Construction Specialties, Inc.
f. IPC Door and Wall Protection Systems; Division of InPro Corporation.
g. Pawling Corporation.
h. <**Insert manufacturer's name.**>

3. Material: Stainless steel, Type [**304**] [**430**].

a. Thickness: Minimum [**0.0500 inch (1.3 mm)**] [**0.0625 inch (1.6 mm)**] [**0.0781 inch (2.0 mm)**].
b. Finish: [**Directional satin, No. 4**] [**Bright annealed**].

4. Wing Size: Nominal [**1-1/2 by 1-1/2 inches (38 by 38 mm)**] [**2-1/2 by 2-1/2 inches (65 by 65 mm)**] [**3-1/2 by 3-1/2 inches (90 by 90 mm)**] <**Insert size**>.
5. Corner Radius: [**1/8 inch (3 mm)**] [**3/4 inch (19 mm)**].
6. Mounting: [**Flat-head, countersunk screws through factory-drilled mounting holes**] [**Oval head, countersunk screws through factory-drilled mounting holes**] [**Double-faced, adhesive foam tape**] [**Adhesive**].

2.7 IMPACT-RESISTANT WALL COVERINGS

A. Semirigid, Impact-Resistant Sheet Wall Covering <**Insert drawing designation**>: Fabricated from plastic sheet wall covering material.

1. Basis-of-Design Product: <**Insert manufacturer's name; product name or designation**> or a comparable product by one of the following:
2. [**Available**]Manufacturers:

a. American Floor Products Co., Inc.
b. ARDEN Architectural Specialties, Inc.
c. Balco, Inc.
d. Construction Specialties, Inc.
e. IPC Door and Wall Protection Systems; Division of InPro Corporation.
f. Korogard Wall Protection Systems; Division of RJF International Corporation.
g. Pawling Corporation.
h. <**Insert manufacturer's name.**>

3. Size: [**48 by 96 inches (1219 by 2438 mm) for sheet**] [**48 by 120 inches (1219 by 3048 mm) for roll**] [**As indicated**].
4. Sheet Thickness: [**0.022 inch (0.56 mm)**] [**0.028 inch (0.7 mm)**] [**0.040 inch (1.0 mm)**] [**0.060 inch (1.5 mm)**] [**0.080 inch (2.0 mm)**] [**0.093 inch (2.4 mm)**] [**0.125 inch (3.0 mm)**] <**Insert thickness**>.
5. Color and Texture: [**As indicated by manufacturer's designations**] [**As selected by Architect from manufacturer's full range**].
6. Trim and Joint Moldings: Extruded rigid plastic that matches sheet wall covering color.
7. Mounting: Adhesive.

2.8 DOOR-PROTECTION SYSTEMS

A. General: Comply with BHMA A156.6.

B. Protection Plates: Fabricated from extruded rigid plastic, of thickness indicated.

1. Basis-of-Design Product: <**Insert manufacturer's name; product name or designation**> or a comparable product by one of the following:
2. [**Available**]Manufacturers:

a. American Floor Products Co., Inc.
b. Construction Specialties, Inc.
c. IPC Door and Wall Protection Systems; Division of InPro Corporation.
d. Korogard Wall Protection Systems; Division of RJF International Corporation.
e. Pawling Corporation.
f. Tepromark International, Inc.
g. <**Insert manufacturer's name.**>

C. Full-Height Door-Surface Protection <**Insert drawing designation**>: Minimum [**0.040-inch (1.0-mm)**] [**0.060-inch (1.5-mm)**] [**0.080-inch (2.0-mm)**] wall thickness; with 90-degree bend for door-edge protection.

1. Color and Texture: [**As indicated by manufacturer's designations**] [**As selected by Architect from manufacturer's full range**].
2. Mounting: [**Adhesive**] [**Countersunk screws through factory-drilled mounting holes**] [**Double-faced adhesive foam tape**].

D. Armor Plates <**Insert drawing designation**>: Minimum [**0.040-inch (1.0-mm)**] [**0.060-inch (1.5-mm)**] [**0.080-inch (2.0-mm)**] wall thickness; beveled 4 sides.

1. Size: [**32 inches (813 mm)**] [**36 inches (914 mm)**] [**40 inches (1016 mm)**] [**42 inches (1067 mm)**] high by door width, with allowance for frame stops.
2. Color and Texture: [**As indicated by manufacturer's designations**] [**As selected by Architect from manufacturer's full range**].
3. Mounting: [**Adhesive**] [**Countersunk screws through factory-drilled mounting holes**] [**Double-faced adhesive foam tape**].

E. Kick Plates <**Insert drawing designation**>: Minimum [**0.040-inch (1.0-mm)**] [**0.060-inch (1.5-mm)**] [**0.080-inch (2.0-mm)**] wall thickness; beveled 4 sides.

1. Size: [**8 inches (203 mm)**] [**10 inches (254 mm)**] [**12 inches (305 mm)**] high by door width, with allowance for frame stops.
2. Color and Texture: [**As indicated by manufacturer's designations**] [**As selected by Architect from manufacturer's full range**].
3. Mounting: [**Adhesive**] [**Countersunk screws through factory-drilled mounting holes**] [**Double-faced adhesive foam tape**].

F. Mop Plates <**Insert drawing designation**>: Minimum [**0.040-inch (1.0-mm)**] [**0.060-inch (1.5-mm)**] [**0.080-inch (2.0-mm)**] wall thickness; beveled 4 sides.

1. Size: [**4 inches (102 mm)**] [**6 inches (152 mm)**] high by 1 inch (25 mm) less than door width.
2. Color and Texture: [**As indicated by manufacturer's designations**] [**As selected by Architect from manufacturer's full range**].
3. Mounting: [**Adhesive**] [**Countersunk screws through factory-drilled mounting holes**] [**Double-faced adhesive foam tape**].

G. Push Plates <**Insert drawing designation**>: Minimum [**0.040-inch (1.0-mm)**] [**0.060-inch (1.5-mm)**] [**0.080-inch (2.0-mm)**] wall thickness; beveled 4 sides.

1. Size: [**12 inches high by 4 inches (305 mm high by 102 mm)**] [**16 inches high by 4 inches (406 mm high by 102 mm)**] <**Insert dimensions**> wide.
2. Color and Texture: [**As indicated by manufacturer's designations**] [**As selected by Architect from manufacturer's full range**].
3. Mounting: [**Adhesive**] [**Countersunk screws through factory-drilled mounting holes**] [**Double-faced adhesive foam tape**].

H. Door-Edge Protection <**Insert drawing designation**>: Fabricated from extruded rigid plastic, minimum [**0.040-inch (1.0-mm)**] [**0.060-inch (1.5-mm)**] wall thickness; formed to fit over door edge without mortising.

1. Basis-of-Design Product: <**Insert manufacturer's name; product name or designation**> or a comparable product by one of the following:
2. [**Available**]Manufacturers:

    a. American Floor Products Co., Inc.
    b. Construction Specialties, Inc.
    c. IPC Door and Wall Protection Systems; Division of InPro Corporation.
    d. Korogard Wall Protection Systems; Division of RJF International Corporation.
    e. Pawling Corporation.
    f. <**Insert manufacturer's name.**>

3. Shape: [**L**] [**U**].
4. Color and Texture: [**As indicated by manufacturer's designations**] [**As selected by Architect from manufacturer's full range**].
5. Mounting: [**Adhesive**] [**Countersunk screws through factory-drilled mounting holes**] [**Double-faced adhesive foam tape**].

I. Door-Frame Protector <**Insert drawing designation**>: Fabricated from extruded rigid plastic, minimum [**0.040-inch (1.0-mm)**] [**0.050-inch (1.3-mm)**] [**0.060-inch (1.5-mm)**] wall thickness; formed to fit entire door-frame profile.

1. Basis-of-Design Product: <**Insert manufacturer's name; product name or designation**> or a comparable product by one of the following:
2. [**Available**]Manufacturers:

    a. American Floor Products Co., Inc.
    b. Construction Specialties, Inc.
    c. IPC Door and Wall Protection Systems; Division of InPro Corporation.
    d. Korogard Wall Protection Systems; Division of RJF International Corporation.
    e. Pawling Corporation.
    f. <**Insert manufacturer's name.**>

3. Height: [**36 inches (914 mm)**] [**48 inches (1219 mm)**] <**Insert dimension**>.
4. Color and Texture: [**As indicated by manufacturer's designations**] [**As selected by Architect from manufacturer's full range**].
5. Mounting: [**Adhesive**] [**Countersunk screws through factory-drilled mounting holes**] [**Double-faced adhesive foam tape**].

J. Door-Frame Protector <**Insert drawing designation**>: Assembly consisting of snap-on plastic cover installed over continuous retainer; formed to fit door frame on opposite side of door swing.

1. Basis-of-Design Product: <**Insert manufacturer's name; product name or designation**> or a comparable product by one of the following:
2. [**Available**]Manufacturers:

a. Construction Specialties, Inc.
b. IPC Door and Wall Protection Systems; Division of InPro Corporation.
c. Korogard Wall Protection Systems; Division of RJF International Corporation.
d. Pawling Corporation.
e. <**Insert manufacturer's name.**>

3. Cover: Extruded rigid plastic, minimum 0.080-inch (2.0-mm) wall thickness; in dimensions and profiles indicated.

a. Height: [**36 inches (914 mm)**] [**48 inches (1219 mm)**] <**Insert dimension**>.
b. Corner Radius: [**1/4 inch (6 mm)**] [**1-1/4 inches (32 mm)**].
c. Color and Texture: [**As indicated by manufacturer's designations**] [**As selected by Architect from manufacturer's full range**].

4. Retainer: Minimum 0.080-inch- (2.0-mm-) thick, 1-piece, extruded aluminum.

K. Door-[**Knob**][**Lever**] Protector <**Insert drawing designation**>: Fabricated from injection-molded plastic, minimum 0.060-inch (1.5-mm) wall thickness.

1. Basis-of-Design Product: <**Insert manufacturer's name; product name or designation**> or a comparable product by one of the following:
2. [**Available**]Manufacturers:

a. American Floor Products Co., Inc.
b. Construction Specialties, Inc.
c. IPC Door and Wall Protection Systems; Division of InPro Corporation.
d. Korogard Wall Protection Systems; Division of RJF International Corporation.
e. Pawling Corporation.
f. <**Insert manufacturer's name.**>

3. Color and Texture: [**As indicated by manufacturer's designations**] [**As selected by Architect from manufacturer's full range**].
4. Mounting: Countersunk screws through factory-drilled mounting holes.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Complete finishing operations, including painting, before installing impact-resistant wall-protection system components.

B. Install impact-resistant wall-protection units level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.

1. Provide splices, mounting hardware, anchors, and other accessories required for a complete installation.

C. Immediately after completion of installation, clean plastic covers and accessories using a standard, ammonia-based, household cleaning agent.

D. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION 102600

SECTION 142100 - ELECTRIC TRACTION ELEVATORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes electric traction [**passenger**] [**and**] [**service**] elevators.

B. Related Sections include the following:

1. Division 03 Section "Cast-in-Place Concrete" for setting sleeves, inserts, and anchoring devices in concrete.
2. Division 04 Section "Unit Masonry" for setting sleeves, inserts, and anchoring devices in masonry and for grouting elevator entrance frames installed in masonry walls.
3. Division 05 Section "Structural Steel Framing" for the following:

    a. Attachment plates, angle brackets, and other preparation of structural steel for fastening guide-rail brackets.
    b. Machine beams.
    c. Divider beams.
    d. Hoist beams.
    e. Structural-steel shapes for subsills that are part of steel frame.

4. Division 05 Section "Metal Fabrications" for the following:

    a. Attachment plates and angle brackets for supporting guide-rail brackets.
    b. Machine beams.
    c. Weld plates for anchoring elevator machine to machine room floor slab.
    d. Divider beams.
    e. Hoist beams.
    f. Structural-steel shapes for subsills.
    g. Pit ladders.
    h. Cants in hoistways made from steel sheet.

5. Division 05 Section "Pipe and Tube Railings" for railings between adjacent elevator pits.
6. Division 05 Section "Decorative Metal" for combination units that contain hall push-button stations.
7. Division 09 painting Sections for field painting of hoistway entrance doors and frames.
8. Division 09 Section "<**Insert Section title**>" for finish flooring in elevator cars.
9. Division 10 Section "Wire Mesh Partitions" for guards between adjacent elevator pits.
10. Division 14 Section "Electric Traction Freight Elevators" for electric traction elevators used primarily for carrying freight and not accessible to the general public.

11. Division 26 Sections for electrical service for elevators to and including[**fused**] disconnect switches at machine room door[**and standby power source, transfer switch, and connection from auxiliary contacts in transfer switch to controller**].
12. Division 27 Section "Communications Horizontal Cabling" for telephone service for elevators.
13. Division 28 Section "Access Control" for security access system equipment used to restrict elevator use.
14. Division 28 Section "Fire Detection and Alarm" for smoke detectors in elevator lobbies to initiate emergency recall operation[**and heat detectors in shafts and machine rooms to disconnect power from elevator equipment before sprinkler activation**] and for connection to elevator controllers.

C. Allowances: Provide finished passenger[**and service**] elevator cars under the Elevator Car Allowance specified in Division 01 Section "Allowances." Allowance includes furnishing and installing the following:

1. Car wall finishes including trim.
2. Car floor finishes.
3. Car ceiling finishes.
4. Car[**and hoistway**] door finishes.
5. Car door sills.
6. Car light fixtures.
7. Handrails.
8. Cutouts and other provisions for installing elevator signal equipment in cars.

1.3 DEFINITIONS

A. Definitions in ASME A17.1 apply to work of this Section.

B. Defective Elevator Work: Operation or control system failure, including excessive malfunctions; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.

C. Service Elevator: A passenger elevator that is also used to carry freight.

1.4 SUBMITTALS

A. Product Data: Include capacities, sizes, performances, operations, safety features, finishes, and similar information. Include product data for the following:

1. Car enclosures and hoistway entrances.
2. Operation, control, and signal systems.

B. Shop Drawings: Show plans, elevations, sections, and large-scale details indicating service at each landing, machine room layout, coordination with building structure, relationships with other construction, and locations of equipment and signals. Include large-scale layout of car control station[**and standby power operation control panel**]. Indicate variations from

specified requirements, maximum dynamic and static loads imposed on building structure at points of support, and maximum and average power demands.

C. Samples for Initial Selection: For finishes involving color selection.

D. Samples for Verification: For exposed finishes of cars, hoistway doors and frames, and signal equipment; 3-inch- (75-mm-) square Samples of sheet materials; and 4-inch (100-mm) lengths of running trim members.

E. Manufacturer Certificates: Signed by elevator manufacturer certifying that hoistway, pit, and machine room layout and dimensions, as shown on Drawings, and electrical service, as shown and specified, are adequate for elevator system being provided.

F. Qualification Data: For Installer.

G. Operation and Maintenance Data: For elevators to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include diagnostic and repair information available to manufacturer's and Installer's maintenance personnel.

H. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.

I. Warranty: Special warranty specified in this Section.

J. Continuing Maintenance Proposal: Service agreement specified in this Section.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Elevator manufacturer[**or manufacturer's authorized representative who is trained and approved for installation of units required for this Project**].

B. Source Limitations: Obtain elevators[**, including hydraulic passenger elevators specified in another Division 14 Section,**] through one source from a single manufacturer.

1. Provide major elevator components, including driving machines, controllers, signal fixtures, door operators, car frames, cabs, and entrances, manufactured by a single manufacturer.

C. Regulatory Requirements: Comply with ASME A17.1[**and elevator design requirements for earthquake loads in ASCE 7**].

1. Effective peak velocity acceleration (Av) for Project's location is [**less than 0.10 (seismic risk zones 0 and 1)**] [**greater than or equal to 0.10, but less than 0.20 (seismic risk zone 2)**] [**greater than or equal to 0.20 (seismic risk zones 3 and 4)**].
2. Provide earthquake equipment required by ASME A17.1.
3. Design earthquake spectral response acceleration, short period (Sds) for Project is <**Insert value**>.
4. Project's seismic design category is [**A**] [**B**] [**C**] [**D**].

5. Elevator importance factor is [**1.5**] [**1.0**].

D. Accessibility Requirements: Comply with Section [**4.10 in the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG).**"] [**407 in ICC A117.1.**]

E. Fire-Rated Hoistway Entrance Assemblies: Door and frame assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible according to [**NFPA 252**] [**UBC Standard 7-2**] [**or**] [**UL 10B**].

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle materials, components, and equipment in manufacturer's protective packaging.

B. Store materials, components, and equipment off of ground, under cover, and in a dry location. Handle according to manufacturer's written recommendations to prevent damage, deterioration, or soiling.

1.7 COORDINATION

A. Coordinate installation of sleeves, block outs, elevator equipment with integral anchors, and other items that are embedded in concrete or masonry for elevator equipment. Furnish templates, sleeves, elevator equipment with integral anchors, and installation instructions and deliver to Project site in time for installation.

B. Coordinate sequence of elevator installation with other work to avoid delaying the Work.

C. Coordinate locations and dimensions of other work relating to electric traction elevators including pit ladders, sumps, and floor drains in pits; entrance subsills[**; machine beams**]; and electrical service, electrical outlets, lights, and switches in pits and [**machine rooms**] [**hoistways**].

1.8 WARRANTY

A. Special Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to repair, restore, or replace defective elevator work within specified warranty period.

1. Warranty Period: [**One year**] <**Insert warranty period**> from date of Substantial Completion.

1.9 MAINTENANCE SERVICE

A. Initial Maintenance Service: Beginning at Substantial Completion, provide [**one year's**] <**Insert time period**> full maintenance service by skilled employees of elevator Installer. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper elevator operation at

rated speed and capacity. Provide parts and supplies same as those used in the manufacture and installation of original equipment.

1. Perform maintenance, including emergency callback service, during normal working hours.
2. Include 24-hour-per-day, 7-day-per-week emergency callback service.

    a. Response Time: Two hours or less.

B. Continuing Maintenance Proposal: Provide a continuing maintenance proposal from Installer to Owner, in the form of a standard [**one-year**] [**two-year**] [**five-year**] <**Insert agreement period**> maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.

C. Continuing Maintenance Proposal: Provide a continuing maintenance proposal from Installer to Owner with terms, conditions, and obligations as set forth in, and in same form as, "Draft of Elevator Maintenance Agreement" at end of this Section, starting on date initial maintenance service is concluded.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Fujitec America, Inc.
2. KONE Inc.
3. Otis Elevator Co.
4. Schindler Elevator Corp.
5. ThyssenKrupp Elevator.
6. <**Insert manufacturer's name.**>

2.2 SYSTEMS AND COMPONENTS

A. General: Provide manufacturer's standard elevator systems. Where components are not otherwise indicated, provide standard components published by manufacturer as included in standard preengineered elevator systems and as required for complete system.

B. Elevator Machines: [**Provide variable-voltage, variable-frequency, ac-type hoisting machines**] [**At manufacturer's option, provide either variable-voltage, variable-frequency, ac-type or variable-voltage, dc-type hoisting machines**]. Provide solid-state power converters.

1. Provide [**regenerative**] [**or**] [**nonregenerative**] system.

2. Limit total harmonic distortion of regenerated power to 5 percent per IEEE 519.
3. Provide means for absorbing regenerated power when elevator system is operating on standby power.
4. Provide line filters or chokes to prevent electrical peaks or spikes from feeding back into building power system.

C. Fluid for Oil Buffers: If oil buffers are used, use only fire-resistant hydraulic fluid containing antioxidant, anticorrosive, antifoaming, and metal-passivating additives.

1. Available Product: Subject to compliance with requirements, a product that may be incorporated into the Work includes, but is not limited to, "Hydro Safe (FR)" by Hydro Safe Oil Division, Inc.

D. Inserts: Furnish required concrete and masonry inserts and similar anchorage devices for installing guide rails, machinery, and other components of elevator work where installation of devices is specified in another Section.

E. Machine Beams: Provide framing to support elevator hoisting machine and deflector sheaves from the building structure. Comply with Division 05 Section "Metal Fabrications" for materials and fabrication.

F. Car Frame and Platform: Welded steel units.

G. Guides: Provide roller guides[**or polymer-coated, nonlubricated sliding guides**] at top and bottom of car and counterweight frames.

2.3 OPERATION SYSTEMS

A. General: Provide manufacturer's standard microprocessor operation system [**for each elevator**] [**for each group of elevators**] as required to provide type of operation system indicated.

B. Group Automatic Operation with Demand-Based Dispatching: Provide[**reprogrammable**] group automatic system that assigns cars to hall calls based on a dispatching program designed to minimize passenger waiting time. System automatically adjusts to changes in demand for different traffic conditions including heavy incoming, heavy two-way, heavy outgoing, and light off-hours as variations of normal two-way traffic.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:

    a. Fujitec America, Inc.; Millennium.
    b. KONE Inc.; KCM 831.
    c. Otis Elevator Co.; Elevonic.
    d. Schindler Elevator Corp.; Miconic TX.
    e. ThyssenKrupp Elevator; Traflomatic.
    f. <**Insert manufacturer's name; product name or designation.**>

C. Destination-Based Group Automatic Operation: Provide reprogrammable group automatic system that assigns elevators leaving the main lobby in the up direction to a selected group of

floors and directs passengers to an elevator serving their destination floor. System dispatches cars in a regulated sequence for optimum system efficiency; dispatch is based on origin and destination of calls. System automatically adjusts to changes in demand for different traffic conditions including heavy incoming, heavy two-way, heavy outgoing, and light off-hours as variations of normal two-way traffic.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:

    a. Otis Elevator Co.; Elevonic with Channeling Operation.
    b. Schindler Elevator Corp.; Miconic 10.
    c. ThyssenKrupp Elevator; TAC50 with Destination Dispatch.
    d. <**Insert manufacturer's name; product name or designation.**>

D. [**Single-Car**]Auxiliary Operations: In addition to primary operation system features, provide the following operational features for elevators where indicated:

1. Standby Power Operation: On activation of standby power, car is returned to a designated floor and parked with doors open. Car can be manually put in service on standby power, either for return operation or for regular operation, by switches in control panel located at [**main lobby**] [**fire command station**] <**Insert location**>. Manual operation causes automatic operation to cease.
2. Standby Powered Lowering: On activation of standby power, if car is at a floor, it remains at that floor, opens its doors, and shuts down. If car is between floors, it is lowered to the next floor below, opens its doors, and shuts down.
3. Battery-Powered Lowering: If power fails and car is at a floor, it remains at that floor, opens its doors, and shuts down. If car is between floors, it is lowered to the next floor below, opens its doors, and shuts down. System includes rechargeable battery and automatic recharging system.
4. Automatic Dispatching of Loaded Car: When car load exceeds 80 percent of rated capacity, doors will begin closing.
5. Nuisance Call Cancel: When car calls exceed a preset number while car load is less than a predetermined weight, all car calls are canceled. Preset number of calls[**and predetermined weight**] can be adjusted.

E. Group Auxiliary Operations: In addition to primary operation system features, provide the following operational features for elevators and elevator groups where indicated:

1. Standby Power Operation: On activation of standby power, cars are returned to a designated floor and parked with doors open. One car is returned at a time, with priority given to loaded cars. If a car cannot be returned after two attempts, it is removed from the system. When all cars have been returned or removed from the system, one car is automatically placed in service. If car selected for service cannot operate within 60 seconds, the system removes car from service and places another car in service. Cars can be manually put in service on standby power, either for return operation or for regular operation, by switches in control panel located at [**main lobby**] [**fire command station**] <**Insert location**>. Manual operation causes automatic operation to cease.
2. Standby Power Operation: On activation of standby power, cars are returned, one at a time, to a designated floor and parked with doors open. If a car cannot be returned, it is removed from the system. When all cars have been returned or removed from the

system, one car can be put in service on standby power by a selector switch in control panel located at [**main lobby**] [**fire command station**] <**Insert location**>.

3. Battery-Powered Lowering: If power fails, cars that are at a floor remain at that floor, open their doors, and shut down. Cars that are between floors are lowered one at a time to the next floor below, open their doors, and shut down. System includes rechargeable battery and automatic recharging system.
4. Automatic Dispatching of Loaded Car: When car load exceeds 80 percent of rated capacity, doors will begin closing.
5. Nuisance Call Cancel: When car calls exceed a preset number while the car load is less than a predetermined weight, all car calls are canceled. Preset number of calls[**and predetermined weight**] can be adjusted.
6. [**Emergency Hospital**] [**Priority**] Service: Service is initiated by a [**keyswitch**] [**card reader**] [**remote switch**] at designated floors. One elevator is removed from group operation and directed to the floor where service was initiated. On arriving at the floor, elevator opens its doors and parks[**and a lighted sign directs passengers to exit elevator**]. Car is placed in operation by selecting a floor and pressing door close button or by operating keyswitch to put car in independent service. After responding to floor selected or being removed from independent service, car is returned to group operation. If car is not placed in operation within a preset time after being called, it is returned to group operation.
7. Independent Service: Keyswitch in car control station removes car from group operation and allows it to respond only to car calls. Key cannot be removed from keyswitch when car is in independent service. When in independent service, doors close only in response to door close button.
8. Loaded-Car Bypass: When car load exceeds 80 percent of rated capacity, car will respond only to car calls, not to hall calls.
9. Distributed Parking: When cars are not required for response to calls, they are parked with doors closed, distributed in predetermined zones throughout the building. One zone shall include the main floor and adjacent floors; remaining floors shall be divided into approximately equal zones.

F. Security Features: Provide the following security features, where indicated. Security features shall not affect emergency firefighters' service.

1. Card-Reader Operation: System uses card readers at [**car control stations**] [**and**] [**hall push-button stations**] to authorize calls. Security system determines which landings and at what times calls require authorization by card reader. Provide required conductors in traveling cable and panel in machine room for interconnecting card readers, other security access system equipment, and elevator controllers. [**Allow space as indicated for card reader in car**] [**Provide stripe-swipe card reader integral with each car control station**].

    a. Security access system equipment is specified in Division 28 Section "Access Control."
    b. Security access system equipment is not in the Contract.

2. Keyswitch Operation: Push buttons are activated and deactivated by security keyswitches at [**car control stations**] [**and**] [**hall push-button stations**]. Key is removable only in deactivated position.
3. Keypad Operation: Allows each landing to be restricted or unrestricted. When a restricted landing button is pressed, a "Restricted Floor" lamp lights and remains lit until

landing access code has been entered into a keypad or predetermined time period has elapsed. Car calls for restricted landings do not register until landing access code is entered into keypad within predetermined time period after landing button is pressed.

a. Access codes are programmed at each car operating panel using a security keyswitch. Keypad operation can be activated and deactivated by security keyswitch at main landing.

4. Car-to-Lobby Feature: Feature, activated by keyswitch at main lobby, that causes [**car**] [**all cars in a group**] to return immediately to lobby and open doors for inspection. On deactivation by keyswitch, calls registered before keyswitch activation are completed and normal operation is resumed.

2.4 DOOR REOPENING DEVICES

A. Infrared Array: Provide door reopening devices with uniform array of 36 or more microprocessor-controlled, infrared light beams projecting across car entrance. Interruption of one or more of the light beams shall cause doors to stop and reopen.

B. Nudging Feature: After car doors are prevented from closing for predetermined adjustable time, through activating door reopening device, a loud buzzer shall sound and doors shall begin to close at reduced kinetic energy.

2.5 FINISH MATERIALS

A. General: Provide the following materials for exposed parts of elevator car enclosures, car doors, hoistway entrance doors and frames, and signal equipment as indicated.

B. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, commercial steel, Type B, exposed, matte finish.

C. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, commercial steel, Type B, pickled.

D. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304.

1. Textured Stainless-Steel Sheet: Product with [**coined**] [**embossed**] texture rolled into exposed surface.

a. Available Product: Subject to compliance with requirements, a product that may be incorporated into the Work includes, but is not limited to, "<**Insert product name**>" by <**Insert manufacturer's name**>.
b. Product: Subject to compliance with requirements, provide "<**Insert product name**>" by <**Insert manufacturer's name**>.
c. Metal surface is [**satin polished**] [**satin relieved**] [**titanium nitride colored**] [**oxide colored**] [**satin polished and titanium nitride colored**] [**satin relieved and titanium nitride colored**] [**satin polished and oxide colored**] [**satin relieved and oxide colored**] [**color coated and satin relieved**] [**color coated and bright relieved**] after rolling.

E. Stainless-Steel Bars: ASTM A 276, Type 304.

F. Stainless-Steel Tubing: ASTM A 554, Grade MT 304.

G. Bronze Plate and Sheet: ASTM B 36/B 36M, Alloy UNS No. C28000 (muntz metal).

H. Bronze Extrusions: ASTM B 455, Alloy UNS No. C38500 (architectural bronze).

I. Bronze Tubing: ASTM B 135 (ASTM B 135M), Alloy UNS No. C23000 (red brass, 85 percent copper).

J. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063.

K. Nickel Silver Extrusions: ASTM B 151/B 151M, Alloy UNS No. C74500 or No. C77600.

L. Plastic Laminate: High-pressure type complying with NEMA LD 3, [**Type HGS for flat applications**] [**Type HGL for flat applications**] [**Type HGP for postformed applications**] [**and**] [**Type BKV for panel backing**].

2.6 CAR ENCLOSURES

A. General: Provide [**enameled-steel car enclosures to receive removable**] [**steel-framed car enclosures with nonremovable**] wall panels, with [**removable**]car roof, access doors, power door operators, and ventilation.

1. Provide standard railings complying with ASME A17.1 on car tops where required by ASME A17.1.
2. Provide finished car including materials and finishes specified below.
3. Refer to "Allowances" Paragraph in Part 1 "Summary" Article for items to be provided under the Elevator Car Allowance. Provide items not included in the Elevator Car Allowance as needed for finished car[**including materials and finishes specified below**].

B. Materials and Finishes: Provide manufacturer's standards, but not less than the following:

1. Subfloor: Underlayment grade, exterior plywood, 5/8-inch (16-mm) nominal thickness.
2. Floor Finish: [**Specified in a Division 09 Section**] [**Elevator manufacturer's standard level-loop nylon carpet; color as selected by Architect from manufacturer's full range**].
3. Enameled-Steel Wall Panels: Flush, hollow-metal construction; fabricated from cold-rolled steel sheet. Provide with factory-applied enamel finish; colors as selected by Architect from manufacturer's full range.
4. Stainless-Steel Wall Panels: Flush, hollow-metal construction; fabricated from stainless-steel sheet.
5. Bronze Wall Panels: Flush, hollow-metal construction; fabricated from bronze sheet.
6. Plastic-Laminate Wall Panels: Plastic laminate adhesively applied to [**1/2-inch (13-mm) fire-retardant-treated particleboard**] [**manufacturer's standard honeycomb core**] with[**plastic-laminate panel backing and**] manufacturer's standard protective edge trim. Panels have a flame-spread index of [**25**] [**75**] or less, when tested according to

ASTM E 84. Plastic-laminate color, texture, and pattern as selected by Architect from [**plastic-laminate**] [**elevator**] manufacturer's full range.

7. Fabricate car with recesses and cutouts for signal equipment.
8. Fabricate car door frame integrally with front wall of car.
9. Enameled-Steel Doors: Flush, hollow-metal construction; fabricated from cold-rolled steel sheet. Provide with factory-applied enamel finish; colors as selected by Architect from manufacturer's full range.
10. Stainless-Steel Doors: Flush, hollow-metal construction; fabricated [**from stainless-steel sheet**] [**or**] [**by laminating stainless-steel sheet to exposed faces and edges of enameled cold-rolled steel doors using adhesive that fully bonds metal to metal without telegraphing or oil-canning**].
11. Bronze Doors: Flush, hollow-metal construction; fabricated by laminating bronze sheet to exposed faces and edges of enameled cold-rolled steel doors using adhesive that fully bonds metal to metal without telegraphing or oil-canning.
12. Plastic-Laminate Doors: Flush, hollow-metal construction; fabricated by laminating plastic laminate to exposed faces of enameled cold-rolled steel doors and covering edges with protective edge trim[**matching return panels**]. Plastic-laminate color, texture, and pattern as selected by Architect from [**plastic-laminate**] [**elevator**] manufacturer's full range.
13. Sight Guards: Provide sight guards on car doors.
14. Sills: Extruded metal, with grooved surface, 1/4 inch (6.4 mm) thick.
15. Luminous Ceiling: Fluorescent light fixtures and ceiling panels of translucent acrylic or other permanent rigid plastic.
16. [**Metal**] [**Metallic-Finish, Plastic-Laminate**] Ceiling: Flush panels, with [**incandescent downlights in the center of**] [**four low-voltage downlights in**] each panel.[**Align ceiling panel joints with joints between wall panels.**]
17. Handrails: Manufacturer's standard handrails, of shape, metal, and finish indicated.

2.7 HOISTWAY ENTRANCES

A. General: Provide manufacturer's standard horizontal-sliding, door-and-frame hoistway entrances complete with track systems, hardware, sills, and accessories. Provide frame size and profile to coordinate with hoistway wall construction.

1. Where gypsum board wall construction is indicated, provide self-supporting frames with reinforced head sections.

B. Materials and Fabrication: Provide manufacturer's standards, but not less than the following:

1. Enameled-Steel Frames: Formed from cold-rolled or hot-rolled steel sheet. Provide with factory-applied enamel finish; colors as selected by Architect from manufacturer's full range.
2. Steel Subframes: Formed from cold-rolled or hot-rolled steel sheet with factory-applied enamel finish or corrosion-inhibiting primer. Fabricate to receive applied finish as indicated.
3. Stainless-Steel Frames: Formed from stainless-steel sheet.
4. Bronze Frames: Formed from cold-rolled or hot-rolled steel sheet, with enamel finish, and with formed-bronze sheet laminated to steel frames using adhesive that fully bonds metal to metal without telegraphing or oil-canning.

5. Enameled-Steel Doors[**and Transoms**]: Flush, hollow-metal construction; fabricated from cold-rolled steel sheet. Provide with factory-applied enamel finish; colors as selected by Architect from manufacturer's full range.
6. Stainless-Steel Doors[**and Transoms**]: Flush, hollow-metal construction; fabricated [**from stainless-steel sheet**] [**or**] [**by laminating stainless-steel sheet to exposed faces and edges of enameled cold-rolled steel doors using adhesive that fully bonds metal to metal without telegraphing or oil-canning**].
7. Bronze Doors[**and Transoms**]: Flush, hollow-metal construction; fabricated by laminating bronze sheet to exposed faces and edges of enameled cold-rolled steel doors using adhesive that fully bonds metal to metal without telegraphing or oil-canning.
8. Plastic-Laminate Doors[**and Transoms**]: Flush, hollow-metal construction; fabricated by laminating plastic laminate to exposed faces of enameled cold-rolled steel doors and covering edges with protective edge trim[**matching door frames**]. Plastic-laminate color, texture, and pattern as selected by Architect from [**plastic-laminate**] [**elevator**] manufacturer's full range.
9. Sight Guards: Provide sight guards on doors matching door edges.
10. Sills: Extruded metal, with grooved surface, 1/4 inch (6.4 mm) thick.
11. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.

2.8 SIGNAL EQUIPMENT

A. General: Provide hall-call and car-call buttons that light when activated and remain lit until call has been fulfilled. Fabricate lighted elements with [**long-life incandescent lamps and acrylic or other permanent, nonyellowing translucent plastic diffusers**] [**or**] [**LEDs**].

B. General: Provide signal equipment designed for destination-based system. Fabricate lighted elements with [**long-life incandescent lamps and acrylic or other permanent, nonyellowing translucent plastic diffusers**] [**or**] [**LEDs**].

C. Car Control Stations: Provide manufacturer's standard [**recessed**] [**or**] [**semirecessed**] car control stations. Mount in return panel adjacent to car door, unless otherwise indicated.

D. Swing-Return Car Control Stations: Provide car control stations mounted on rear of hinged return panel adjacent to car door and with buttons, switches, controls, and indicator lights projecting through return panel but substantially flush with face of return panel.

1. Mark buttons and switches with standard identification for required use or function that complies with ASME A17.1. Use both tactile symbols and Braille.
2. Provide "No Smoking" sign matching car control station, either integral with car control station or mounted adjacent to it, with text and graphics as required by authorities having jurisdiction.

E. Emergency Communication System: Provide system that complies with ASME A17.1 and the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)." On activation, system dials preprogrammed number of monitoring station and identifies elevator location to monitoring station. System provides two-way voice communication without using a handset and provides visible signals that indicate when system has been activated and when monitoring

station has responded. System is contained in flush-mounted cabinet, with identification, instructions for use, and battery backup power supply.

F. Firefighters' Two-Way Telephone Communication Service: Provide [**flush-mounted cabinet**] [**telephone jack**] in each car and required conductors in traveling cable for firefighters' two-way telephone communication service specified in Division 28 Section "Fire Detection and Alarm."

G. Car Position Indicator: Provide [**illuminated,**]digital-type car position indicator, located above car door or above car control station. Also provide audible signal to indicate to passengers that car is either stopping at or passing each of the floors served.

1. Include travel direction arrows if not provided in car control station.

H. Hall Push-Button Stations: Provide one hall push-button station at each landing[**for each single elevator or group of elevators, but not less than one station for each four elevators in a group**].

I. Hall Push-Button Stations: Provide hall push-button stations at each landing as indicated.

1. Provide manufacturer's standard wall-mounted units.
2. Provide units with flat faceplate for mounting with body of unit recessed in wall.
3. Equip units with buttons for calling elevator and for indicating desired direction of travel.
4. Equip units with [**buttons**] [**or**] [**touch screen**] for calling elevator and for indicating direction of travel or destination as required by system. Provide a signaling system to verify floor selection, where destination registration is required, and to direct passengers to appropriate car.

    a. Provide a means for passengers to indicate that they have disabilities so control system can allow extra room in assigned car.
    b. Provide for connecting units that require destination registration to building security access system so a card reader can be used to register calls.

5. Provide telephone jack in each unit for firefighters' two-way telephone communication service specified in Division 28 Section "Fire Detection and Alarm."

J. Hall Lanterns: Units with illuminated arrows; but provide single arrow at terminal landings. Provide[**one of**] the following:

1. Manufacturer's standard wall-mounted units, for mounting above entrance frames.
2. Units with flat faceplate for mounting with body of unit recessed in wall and with illuminated elements projecting from faceplate for ease of angular viewing.
3. Units mounted in both jambs of entrance frame[**for each elevator**].
4. Units mounted in both car door jambs[**; may be used only for single elevators or for two-car groups**].

K. Hall Annunciator: With each hall lantern, provide audible signals indicating car arrival and direction of travel. Signals sound once for up and twice for down.

1. At manufacturer's option, audible signals may be placed on[**each**] car.

L. Hall Position Indicators: Provide [**illuminated,**]digital-display-type position indicators, located above[**each**] hoistway entrance at ground floor. Provide units with flat faceplate for mounting with body of unit recessed in wall.

1. Integrate ground-floor hall lanterns with hall position indicators.

M. Standby Power Elevator Selector Switches: Provide switches, as required by ASME A17.1, where indicated. Adjacent to switches, provide illuminated signal that indicates when normal power supply has failed.[**For each elevator, provide illuminated signals that indicate when they are operational and when they are at the designated emergency return level with doors open.**]

N. Fire Command Center Annunciator Panel: Provide panel containing illuminated position indicators for each elevator, clearly labeled with elevator designation; include illuminated signal that indicates when elevator is operational and when it is at the designated emergency return level with doors open. Provide standby power elevator selector switch(es), as required by ASME A17.1, adjacent to position indicators. Provide illuminated signal that indicates when normal power supply has failed.

O. Corridor Call Station Pictograph Signs: Provide signs matching hall push-button stations, with text and graphics as required by authorities having jurisdiction, indicating that in case of fire elevators are out of service and exits should be used instead. Provide one sign at each hall push-button station, unless otherwise indicated.

2.9 ELEVATORS

A. Elevator Description:

1. Group Number: <**Insert a different number for each group of elevators that share a group operation system.**>
2. Elevator Number(s): <**Insert elevator number(s) as shown on Drawings.**>
3. Service Elevator Number(s): <**Insert elevator number(s) as shown on Drawings.**>
4. Type: [**Geared**] [**Gearless**] traction.
5. Machine Location: [**Machine room above hoistway**] [**Hoistway; no machine room is provided**].
6. Rated Load: [**2000 lb (908 kg)**] [**2100 lb (953 kg)**] [**2500 lb (1135 kg)**] [**3000 lb (1362 kg)**] [**3500 lb (1589 kg)**] [**4000 lb (1816 kg)**] [**4500 lb (2043 kg)**] [**5000 lb (2270 kg)**] <**Insert load**>.
7. Freight Loading Class for Service Elevator(s): Class A.
8. Rated Speed: [**200 fpm (1.0 m/s)**] [**350 fpm (1.8 m/s)**] [**400 fpm (2.0 m/s)**] [**450 fpm (2.3 m/s)**] [**500 fpm (2.5 m/s)**] [**700 fpm (3.6 m/s)**] [**800 fpm (4.1 m/s)**] [**1000 fpm (5.1 m/s)**] [**1200 fpm (6.1 m/s)**] [**1400 fpm (7.1 m/s)**] <**Insert speed**>.
9. Operation System: [**Selective collective automatic operation**] [**Group automatic operation**] [**Group automatic operation with demand-based dispatching**] [**Destination-based group automatic operation**].
10. Auxiliary Operations:

    a. Standby power operation.
    b. Standby powered lowering.
    c. Battery-powered lowering.

d. Earthquake Emergency Operation: Comply with requirements in ASME A17.1.
e. Automatic dispatching of loaded car.
f. Nuisance call cancel.
g. [**Emergency hospital**] [**Priority**] service at [**all**] <**Insert floor designations**> floors.
h. Independent service for [**service elevator**] [**all cars in group**].
i. Loaded-car bypass.
j. Distributed parking.

11. Security Features: [**Card-reader operation**] [**Keyswitch operation**] [**Keypad operation**] [**Car-to-lobby feature**].
12. Dual Car Control Stations: Provide two car control stations[**in each elevator**]; equip only one with required keyswitches if any.
13. Car Enclosures:

a. Inside Width: [**64 inches (1626 mm)**] [**68 inches (1727 mm)**] [**80 inches (2032 mm)**] [**92 inches (2337 mm)**] <**Insert width**> from side wall to side wall.
b. Inside Depth: [**51 inches (1295 mm)**] [**53 inches (1346 mm)**] [**57 inches (1448 mm)**] [**65 inches (1651 mm)**] [**87-1/2 inches (2222 mm)**] [**90 inches (2286 mm)**] [**93 inches (2362 mm)**] [**93-1/2 inches (2375 mm)**] [**96 inches (2438 mm)**] [**101 inches (2565 mm)**] [**102 inches (2591 mm)**] <**Insert depth**> from back wall to front wall (return panels).
c. Inside Height: [**88 inches (2235 mm)**] [**92 inches (2337 mm)**] [**94 inches (2388 mm)**] [**100 inches (2540 mm)**] [**104 inches (2642 mm)**] [**108 inches (2743 mm)**] [**112 inches (2845 mm)**] <**Insert height**> to underside of ceiling.
d. Front Walls (Return Panels): [**Polished stainless steel, No. 8 finish**] [**Satin stainless steel, No. 4 finish**] [**Polished bronze, lacquered**] [**Satin bronze, lacquered**].
e. Car Fixtures: [**Polished stainless steel, No. 8 finish**] [**Satin stainless steel, No. 4 finish**] [**Polished bronze, lacquered**] [**Satin bronze, lacquered**].
f. Side and Rear Wall Panels: [**Enameled steel**] [**Plastic laminate**] [**Satin stainless steel, No. 4 finish**] [**Textured stainless steel**].
g. Reveals: [**Enameled steel**] [**Polished stainless steel, No. 8 finish**] [**Satin stainless steel, No. 4 finish**] [**Polished bronze, lacquered**] [**Satin bronze, lacquered**].
h. Door Faces (Interior): [**Enameled steel**] [**Polished stainless steel, No. 8 finish**] [**Satin stainless steel, No. 4 finish**] [**Textured stainless steel**] [**Polished bronze, lacquered**] [**Satin bronze, lacquered**] [**Plastic laminate**].
i. Door Sills: [**Aluminum, mill finish**] [**Bronze, polished**] [**Nickel silver, polished**].
j. Ceiling: [**Luminous ceiling**] [**Polished stainless steel, No. 8 finish**] [**Satin stainless steel, No. 4 finish**] [**Polished bronze, lacquered**] [**Reflective metallic-finish, plastic-laminate, stainless steel**] [**Reflective metallic-finish, plastic-laminate, bronze**].
k. Handrails: [**1-1/2 inches (38 mm) round**] [**1/2 by 2 inches (13 by 50 mm) rectangular**] <**Insert description**> [**mirror-polished stainless steel, No. 8 finish**] [**satin stainless steel, No. 4 finish**] [**mirror-polished bronze, lacquered**] [**satin bronze, lacquered**], at [**sides**] [**and**] [**rear**] of car.
l. Floor: Manufacturer's standard carpet.
m. Floor prepared to receive carpet (specified in Division 09 Section "Sheet Carpeting").

n. Floor prepared to receive resilient tile (specified in Division 09 Section "Resilient Tile Flooring").
o. Floor prepared to receive sheet vinyl (specified in Division 09 Section "Resilient Sheet Flooring").
p. Floor recessed and prepared to receive [**dimension stone tile (specified in Division 09 Section "Stone Tiling")**] [**ceramic tile (specified in Division 09 Section "Tiling")**].
q. Floor Thickness, Including Setting Materials: <**Insert thickness**> above plywood subfloor.

14. Hoistway Entrances: As follows:

a. Width: [**36 inches (914 mm)**] [**42 inches (1067 mm)**] [**48 inches (1219 mm)**] [**54 inches (1372 mm)**] <**Insert width**>.
b. Height: [**84 inches (2134 mm)**] [**96 inches (2438 mm)**] <**Insert height**>.
c. Type: [**Single-speed side sliding**] [**Two-speed side sliding**] [**Single-speed center opening**] [**Two-speed center opening**].
d. Fire-Protection Rating: [**1 hour**] [**1-1/2 hours**] <**Insert rating**>[**with 30-minute temperature rise of 450 deg F (250 deg C)**].
e. Frames [**at First Floor**] [**at Basement Floors**]: [**Enameled steel**] [**Polished stainless steel, No. 8 finish**] [**Satin stainless steel, No. 4 finish**] [**Polished bronze, lacquered**] [**Satin bronze, lacquered**].
f. Frames at Other Floors: [**Enameled steel**] [**Polished stainless steel, No. 8 finish**] [**Satin stainless steel, No. 4 finish**] [**Polished bronze, lacquered**] [**Satin bronze, lacquered**].
g. Doors [**and Transoms**] [**at First Floor**] [**at Basement Floors**]: [**Enameled steel**] [**Polished stainless steel, No. 8 finish**] [**Satin stainless steel, No. 4 finish**] [**Textured stainless steel**] [**Polished bronze, lacquered**] [**Satin bronze, lacquered**] [**Plastic laminate**].
h. Doors[**and Transoms**] at Other Floors: [**Enameled steel**] [**Polished stainless steel, No. 8 finish**] [**Satin stainless steel, No. 4 finish**] [**Textured stainless steel**] [**Polished bronze, lacquered**] [**Satin bronze, lacquered**] [**Plastic laminate**].
i. Sills [**at First Floor**] [**at Basement Floors**]: [**Aluminum, mill finish**] [**Bronze, polished**] [**Nickel silver, polished**].
j. Sills at Other Floors: [**Aluminum, mill finish**] [**Bronze, polished**] [**Nickel silver, polished**].

15. Hall Fixtures [**at First Floor**] [**at Basement Floors**]: [**Polished stainless steel, No. 8 finish**] [**Satin stainless steel, No. 4 finish**] [**Polished bronze, lacquered**] [**Satin bronze, lacquered**] [**Recessed type with no exposed-metal surfaces**].
16. Hall Fixtures at Other Floors: [**Polished stainless steel, No. 8 finish**] [**Satin stainless steel, No. 4 finish**] [**Polished bronze, lacquered**] [**Satin bronze, lacquered**] [**Recessed type with no exposed-metal surfaces**].
17. Additional Requirements:

a. Provide inspection certificate in each car, mounted under acrylic cover with frame made from [**polished stainless steel, No. 8 finish**] [**satin stainless steel, No. 4 finish**] [**polished bronze, lacquered**] [**satin bronze, lacquered**].
b. Provide blanket hooks[**in all cars**] and [**one**] [**two**] <**Insert number**> complete set(s) of full-height protective blankets.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine elevator areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance. Examine hoistways, hoistway openings, pits, and machine rooms as constructed; verify critical dimensions; and examine supporting structure and other conditions under which elevator work is to be installed.

1. For the record, prepare a written report, endorsed by Installer, listing dimensional discrepancies and conditions detrimental to performance or indicating that dimensions and conditions were found to be satisfactory.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's written instructions.

B. Welded Construction: Provide welded connections for installing elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance, and replacement of worn parts. Comply with AWS standards for workmanship and for qualifications of welding operators.

C. Sound Isolation: Mount rotating and vibrating equipment on vibration-isolating mounts designed to minimize transmission of vibrations to structure and thereby minimize structure-borne noise from elevator system.

D. Lubricate operating parts of systems, including ropes, as recommended by manufacturers.

E. Alignment: Coordinate installation of hoistway entrances with installation of elevator guide rails for accurate alignment of entrances with car. Where possible, delay final adjustment of sills and doors until car is operable in shaft. Reduce clearances to minimum, safe, workable dimension at each landing.

F. Leveling Tolerance: 1/8 inch (3 mm), up or down, regardless of load and direction of travel.

G. Set sills flush with finished floor surface at landing. Fill space under sill solidly with nonshrink, nonmetallic grout.

H. Locate hall signal equipment for elevators as follows, unless otherwise indicated:

1. For groups of elevators, locate hall push-button stations between two elevators at center of group or at location most convenient for approaching passengers.
2. Place hall lanterns either above or beside each hoistway entrance.
3. Mount hall lanterns at a minimum of 72 inches (1829 mm) above finished floor.

3.3 FIELD QUALITY CONTROL

A. Acceptance Testing: On completion of elevator installation and before permitting use (either temporary or permanent) of elevators, perform acceptance tests as required and recommended by ASME A17.1 and by governing regulations and agencies.

B. Operating Test: Load [**elevator**] [**each elevator**] [**one elevator of each type, capacity, speed, and travel distance**] to rated capacity and operate continuously for 30 minutes over full travel distance, stopping at each level and proceeding immediately to the next. Record temperature rise of elevator machine during 30-minute test period. Record failure to perform as required.

C. Advise Owner, Architect, and authorities having jurisdiction in advance of dates and times tests are to be performed on elevators.

3.4 PROTECTION

A. Temporary Use: [**Limit temporary use for construction purposes to one elevator.**]Comply with the following requirements for[**each**] elevator used for construction purposes:

1. Provide car with temporary enclosure, either within finished car or in place of finished car, to protect finishes from damage.
2. Provide strippable protective film on entrance and car doors and frames.
3. Provide padded wood bumpers on entrance door frames covering jambs and frame faces.
4. Provide other protective coverings, barriers, devices, signs, and procedures as needed to protect elevator and elevator equipment.
5. Do not load elevators beyond their rated weight capacity.
6. Engage elevator Installer to provide full maintenance service. Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as necessary for proper elevator operation at rated speed and capacity. Provide parts and supplies same as those used in the manufacture and installation of original equipment.
7. Engage elevator Installer to restore damaged work, if any, so no evidence remains of correction. Return items that cannot be refinished in the field to the shop, make required repairs and refinish entire unit, or provide new units as required.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to operate[**, adjust, and maintain**] elevator(s). Refer to Division 01 Section "Demonstration and Training."

B. Check operation of[**each**] elevator with Owner's personnel present and before date of Substantial Completion. Determine that operation systems and devices are functioning properly.

C. Check operation of[**each**] elevator with Owner's personnel present not more than one month before end of warranty period. Determine that operation systems and devices are functioning properly.

END OF SECTION 142100

SECTION 142350 - ELEVATOR MAINTENANCE REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections apply to this Section

1.2 BONDS AND INSURANCE REQUIREMENTS

A. Elevator Contractor shall provide with Bid Proposal, an in-force copy of certificate of insurance with the following minimum liability limits:

General Liability	$1,000,000
Occurrence Liability	$1,000,000
Personal Injury	$1,000,000
Workers Compensation	$100,000

B. Elevator Contractor shall provide with Bid Proposal a letter from its bonding company confirming that elevator contractor will be able to supply in a timely manner a Performance Bond at 100% of the current contract year amount. Letter shall also state that a Performance Bond will be renewed yearly.

PART 2 – PRODUCTS

2.01 DESCRIPTION OF WORK

A. Elevator Contractor shall supply trained, qualified, and technically skilled journeymen directly employed and supervised by Elevator Contractor. Elevator maintenance shall include all supervision, installed repair parts, consumable materials, equipment, tools, and every item of expense necessary for elevator maintenance, including all preventative maintenance, repairs, or parts and trouble call service.

B. For specific information on elevators covered under this specification, Refer to SECTION 142360.

PART 3 - EXECUTION

3.01 WORK INCLUDED

A. Regularly and systematically examine, adjust, lubricate, clean, and when conditions warrant, repair or replace the following items and all other mechanical or electrical equipment related thereto:

B. Traction Elevators #1, #2 and #3”

1. Machine: worm, gear, thrust bearings, lateral bearings, shaft bearings, drive sheave, and other machine components.
2. Brake pulley, brake coil, brake pins, brake contacts, linings, and other brake components.
3. Motor and motor generator: Motor windings, rotating elements, commutators, brushes, brush holders, bearings field coils, rotators, stator slip rings.
4. Controller and dispatching equipment: All components including all relays solid state components, resistors, condensers, transformers, contacts, leads, computer devices, mechanical or electrical driving equipment, coils magnet frames, contact switch assemblies, springs, solenoids, resistance grids, hoistway vanes, magnets and inductors.
5. Governor: Including governor sheave shaft assembly gears, bearing contacts, jaws and pit tension assembly.
6. Sheaves: Including defector sheaves, shafts, bearings, grease retainers, contacts and hold down devices.
7. Hoistway door interlocks or locks and contacts, hoistway door hangers, tracks, bottom door gibs, cams and rollers.
8. Hoistway limit switches, slowdown switches, leveling switches and associated cams, vanes and electronic components.
9. Guide shoes including rollers.
10. Automatic power operated door operators, door protective devices, car door hangers, tracks and car door contacts.
11. Traveling cables.
12. Elevator control wiring in hoistway and machine room.
13. Hoist cables, governor cables, compensating chains, including adjustment of tension on all cables.
14. Car safety mechanism and load weighing equipment.
15. Buffers.
16. Fixture contracts, pushbuttons, key switches, locks, lamps, and sockets or button stations (car and hall), hall lanterns, position indicators, direction indicators.
17. The guide rails shall be kept free of rust and dry.
18. Examine all safety devices and governors, and conduct an annual no load test, and every fifth year perform a full load, full speed test of safety mechanism, overhead speed governors, car and counterweight buffers. The car balance shall be checked and governor set. If required, the governor shall be calibrated and sealed for proper tripping speed. All tests shall be performed in accordance with provisions of the American National Standard, Safety Code for Elevators and Escalators (ANSI/ASME A17.2), current edition.
19. Furnish lubricants compounded specifically for elevator usage.

C. Service Elevator #4:

1. AC drum power unit and accessories: motor, pulleys, drive belts, sound and vibration isolators, piping and other components.
2. Controller, selector, and dispatching equipment: All components including all relays, solid state components, resistors, condensers, transformers, contacts, leads, computer devices, selector switches, mechanical or electrical driving equipment, coils, magnet frames, contact switch assemblies, springs, solenoids, resistance grids, hoistway vanes, magnets and inductors.
3. Hoistway door interlocks or locks and contracts, hoistway door hangers, tracks, bottom door gibs, cams and rollers.
4. Hoistway limit switches, slowdown switches, leveling switches and associated cams, vanes and electronic components.
5. Guide shoes including rollers.
6. Automatic power operated door operators, door protective devices, car door hangers, tracks, and car door contacts.
7. Automatic power operated (or manually operated) door operators, door protective devices, car door hangers, tracks and car door contacts.
8. Elevator control wiring in hoistway and machine room.
9. Buffers.
10. Fixture contacts, pushbuttons, key switches, locks, lamps and sockets or button stations (car and hall if included), hall lanterns, position indicators, direction indicators (if included).
11. The guide rails shall be kept free of rust and dry.
12. Examine all safety devices, and conduct an annual no load test, and every fifth year perform a full load, full speed test of the buffers. The car balance shall be checked. All tests shall be performed in accordance with the provisions of the American National Standard, Safety Code for Elevators and Escalators (ANSI/ASME A17.2), current edition.
13. Furnish lubricants compounded specifically for elevator usage.
14. All preventative maintenance and adjusting shall meet the minimum standards established by the original equipment manufacturer of the elevator equipment.

D. The Elevator Contractor shall be financially responsible for the job they do and DFCM will call for damages for extended shutdowns or repeated shutdowns. If there are more than two shutdowns for the same reason within a one month period, DFCM will charge the Elevator Contractor $300 per occurrence.

3.02 WORK NOT INCLUDED

A. The Elevator Contractor shall not be required to install new attachments on the elevator whether or not recommended or directed by insurance companies or by governmental authorities, nor make any replacements with parts of a different design. The Elevator Contractor shall not be required to make renewals or repairs necessitated by reason of

negligence or misuse of the equipment or by reason of any other cause beyond the Elevator Contractor's control except ordinary wear and tear unless the Elevator Contractor receives just compensation.

B. The Elevator Contractor shall not be responsible for the following items of elevator equipment: car enclosure (including removable panels, door panels, hung ceilings, light diffusers, light tubes, and bulbs, handrails, and carpets), hoistway enclosure, hoistway doors, frames, and sills.

C. Elevator Contractor shall not be responsible for building items related to the elevator which are not installed by elevator mechanics such as electrical disconnect switches, etc.

3.03 CONDITIONS OF THE WORK

A. All work is to be performed during regular working hours of regular working days. Emergency calls shall be answered at all hours of the day or night. Should overtime work be required, DFCM will pay only the actual amount of the premium portion of the wage, the Elevator Contractor will pay the basic hourly rate.

B. The Elevator Contractor shall check the operation and control and make necessary tests to insure that all circuits and time settings are properly adjusted, and that the system performs as designed and installed.

C. The Elevator Contractor shall keep the elevators maintained to operate at the original contract speed keeping the original performance times, including acceleration and retardation as designed and installed by the manufacturer. The door operation shall be adjusted as required to maintain the original door opening and door closing times, within legal limits.

D. DFCM reserves the right to make a thorough inspection and test as and when deemed advisable. If it is found that the elevator and associated equipment are deficient either electrically or mechanically, the Elevator Contractor will be notified of these deficiencies in writing, and it shall be his responsibility to make corrections within 30 days, DFCM may terminate the contract and employ another Elevator Contractor to make the corrections at the original Elevator Contractor's expense.

E. Approximately, six months prior to the end of the contract term, DFCM will make a thorough maintenance inspection of all elevators covered under the contract. At the conclusion of this inspection, DFCM shall give the Elevator Contractor written notice of any deficiencies found. The Elevator Contractor shall be responsible for correction of these deficiencies within 30 days after receipt of such notice.

3.04 PARTS INVENTORY REQUIREMENTS

Elevator Contractor agrees to the following requirements and authorization of parts used:

A. One complete set of all diagnostic tools and equipment required for the complete maintenance of all aspects of the control and dispatch system and solid-state motor drive units. The diagnostic system shall be an integral part of the controller or a portable device provided to DFCM at transfer of maintenance to another company, and provide user-friendly interaction between the service person and the controls. All such systems shall be free from secret codes and decaying circuits that must be periodically reprogrammed by the manufacturer.

B. All parts need to be readily available within five (5) working days.

C. Major Components Parts (Electrical): If Elevator Contractor does not have motors, pumps, valves, etc, or should repairs be repaired by a qualified motor shop, Elevator Contractor must cause the repairs to be completed within two (2) working days, or less.

D. Major Components Parts (Mechanical): If Elevator Contractor does not have machine components, frames, sheaves, cabs, rails, and similar mechanical components in stock, they must provide DFCM within two working days. If this exceeds two working days, Elevator Contractor shall supply DFCM with source for the repair or replacement, as well as, an approximate schedule to complete the repairs.

E. Special Electric Parts: Elevator Contractor acknowledges that elevator control systems contain solid state printed circuit modules. Elevator Contractor agrees to maintain in inventory, a sufficient amount of modules and component parts to replace and or repair any of these units should failure occur. SCR Drive Components are to be inventoried in Elevator Contractor’s warehouse.

F. Job Site Elevator Inventory: Elevator Contractor shall maintain a supply of contacts, coils, car and hall pushbuttons, lantern gongs, door detectors, safety edges, lubricants, wiping cloths, and minor parts in each elevator machine room, properly stored in an approved parts cabinet.

G. Spare Parts Inventory: Elevator Contractor shall maintain a supply of genuine Original Equipment Manufacturer’s replacement parts in their warehouse inventory. This inventory will include, but not be limited to, door operator motors, controller boards, switch contacts, tapes, door hangers, rollers, hoistway limit switches. Such replacement parts will be kept in warehouse inventory or available from their manufacturing facilities. Regardless of the location of the stored parts, they shall be available on the jobsite within forty-eight (48) hours from the time of need.

H. Replacement Parts Policy: Elevator Contractor will not alter equipment parts and original design with other manufacturers' parts or design unless the original manufacturer has discontinued the item and the parts are no longer available from the manufacturer or other DFCM approved suppliers. Parts manufactured by companies other the original manufacturer, but supplied to the manufacturer as part of their overall product may be acceptable if said part is of a similar design and character boards, relays, coils, rollers, buttons, proximity edges, and various other parts are duplicated by other national recognized manufacturers and, upon written authorization from DFCM or DFCM's representative, may be used in lieu of the manufacturer's parts. Elevator Contractor agrees to maintain a diagnostic tool to remain on the job site, and one set of spare boards, as required, on the job site or in Elevator Contractor's local branch office for the entire length of the Agreement. Any boards used out of stock will be replaced within twenty-four (24) hours.

3.05 MODICATION APPROVALS:

Should Elevator Contractor request or wish to make any change, modification, or addition to the existing elevator equipment, the Elevator Contractor must submit a written "Request to Modify" proposal to DFCM for approval. A "Request to Modify" must state the reason why the Company wishes to change a component. Complete information of the new proposed component and a guarantee of responsibility by Elevator Contractor for said component change is required. DFCM will respond to the Elevator Contractor within 30 days of receiving this request.

3.06 EMERGENCY RESPONSE

In the case of entrapment by an individual inside an elevator, the Company will respond within an hour of receiving the emergency call.

3.07 CODE TESTING REQUIRED

Elevator Contractor shall perform all State, City, Local, and ANSI A17.1 required testing. Only those Codes that are in force as of the Commencement Date of this Agreement are applicable. Company will give DFCM at least a one day notice prior to any testing being performed.

A. ASME A17-1 (Latest edition enforced in the State of Utah): Elevator Contractor shall test Fireman's Return Phase I and II, a minimum of once a year, and notify DFCM prior to conducting such test. Any and all required corrections shall be the responsibility of the Elevator Contractor and shall be corrected at no additional charge to DFCM. The results of these tests shall be submitted in writing to DFCM within 30 days after test is completed. Elevator Contractor shall train, provide forms and advise recording requirements for monthly testing for DFCM designated personnel.

B. Earthquake Device Testing: Elevator Contractor shall test earthquake derailment and seismic safety devices a minimum of once a year only in areas where applicable.

Notification shall be given to DFCM prior to such test. Any and all required corrections shall be the responsibility of the Elevator Contractor and shall be corrected at no additional charge to DFCM.

3.08 PERFORMANCE REQUIREMENTS

Elevator Contractor agrees to maintain the following minimum requirements of each as described per manufacturer's original installation criteria. (Note: Bidder shall submit proposed standards if they differ from those specified in the elevator modernization section.)

A. Floor to Floor Time: (In Seconds)
Floor-to floor time shall be measured from the time the elevator starts to the time the elevator stops during a one floor run in either direction and under any load condition.

B. Door-Open Time: (In Seconds)
Door-opening times are measured by the distance of the door travel less 1" for center opening doors and 2" for side-opening doors from each end of the door travel.

C. Door-Close Time: (In Seconds)
Not to exceed 30 pounds of kinetic force.
Door closing times are measured by the distance of the door travel less 1" for center-opening doors and 2" for side-opening doors from each end of the door travel.

D. Car/Hall Dwell Time: (In Seconds)
Standing door open times are measured from the time the doors are fully open, without demand, until the doors start to close.

E. Nudging Close Time: (In Seconds)
Nudging close time is measured the same as the door close time.

F. Stopping Zone
3/8" for hydraulic elevators and open loop traction elevators.
1/4" for closed loop traction elevators.
The accuracy of leveling shall be plus or minus the 3/8" and 1/4" mentioned above under all load conditions. Leveling shall be consistent with OEM installation and Code Requirements.

G. Variance from the rated contract speed, regardless of load conditions shall not exceed five percent (5%).

H. Maintain vertical alignment of guide rails to a tolerance of 1/16 in. at 100'.
To accomplishing this, Company shall maintain a comfortable elevator ride with smooth acceleration, retardation and a soft stop. Door operation shall be quiet and positive, with smooth checking at the extremes of travel. Company shall assign a Supervisor to examine

all equipment yearly as a minimum requirement. Results of the inspection shall be submitted to DFCM within thirty (30) days form completion of Supervisor's Inspection.

3.09 MINIMUM MAN HOURS AT PREMISES

A. Elevator Contractor shall furnish a mechanic to provide preventative maintenance services at the premises for a minimum of two and a half (2 ½) hours per calendar month per traction elevator, one (1) hour per calendar month per hydraulic elevator, 2 hours per quarter for residence elevators. **Callbacks and nonscheduled repair labor are not considered service time.** Failure to provide the preventative maintenance services set forth, shall be cause for retention of monthly fees by DFCM equal to the reduction of Elevator Contractor's services and shall continue until full, normal service is restored. Elevator Contractor may choose to make up time lost at the conclusion of any period of interruption of service and be reimbursed for same if agreed to in writing by DFCM. Time tickets for routine maintenance shall be presented to the appropriate on site personnel or building representative at the conclusion of each visit and shall only show the time spent for preventative maintenance. Any other work completed, such as repairs or call back service shall be listed and accounted for on a separate time ticket. It is understood that such minimum service hours do not limit labor required to maintain the elevator equipment in top running condition.

B. All preventative maintenance service, repairs, routine adjusting and service procedures will be performed during regular working hours of regular working days of the elevator trade referring to the hours of 8:00 a.m. to 4:30 p.m., Monday through Friday. If DFCM demands that needed two-man repair work be completed during overtime hours, Elevator Contractor will bill the difference between their straight time billing rate and the appropriate overtime billing rate. Notification to DFCM must be made prior to removal of the elevators from normal service for maintenance, testing and adjustment.

END OF SECTION 143250

SECTION 260500 – COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Electrical equipment coordination and installation.
2. Sleeves for raceways and cables.
3. Common electrical installation requirements.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

1.4 COORDINATION

A. Coordinate arrangement, mounting, and support of electrical equipment:

1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
3. To allow right of way for piping and conduit installed at required slope.
4. So connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.

B. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

C. Coordinate location of access panels and doors for electrical items that are behind finished surfaces or otherwise concealed. Access doors and panels are specified in Division 8 Section "Access Doors and Frames."

D. Coordinate electrical testing of electrical, mechanical, and architectural items, so equipment and systems that are functionally interdependent are tested to demonstrate successful interoperability.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 SLEEVES FOR RACEWAYS AND CABLES

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

B. Sleeves for Rectangular Openings: Galvanized sheet steel with minimum 0.052- or 0.138-inch thickness as indicated and of length to suit application.

C. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 7 Section "Through-Penetration Firestop Systems."

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

A. Comply with NECA 1.

B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.

E. Right of Way: Give to raceways and piping systems installed at a required slope.

3.2 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Electrical penetrations occur when raceways, cables, wireways, cable trays, or busways penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.

B. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 7 Section "Through-Penetration Firestop Systems."

C. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.

D. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

E. Rectangular Sleeve Minimum Metal Thickness:

1. For sleeve cross-section rectangle perimeter less than 50 inches and no side greater than 16 inches, thickness shall be 0.052 inch.
2. For sleeve cross-section rectangle perimeter equal to, or greater than, 50 inches and 1 or more sides equal to, or greater than, 16 inches, thickness shall be 0.138 inch.

F. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.

G. Cut sleeves to length for mounting flush with both surfaces of walls.

H. Extend sleeves installed in floors 2 inches above finished floor level.

I. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable unless seismic criteria require a different clearance.

J. Seal space outside of sleeves with grout for penetrations of concrete and masonry and with approved joint compound for gypsum board assemblies.

K. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Refer to Division 7 Section "Joint Sealants" for materials and installation.

L. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway and cable penetrations. Install sleeves and seal raceway and cable penetration sleeves with firestop materials. Comply with Division 7 Section "Through-Penetration Firestop Systems."

M. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.

N. Aboveground, Exterior-Wall Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

3.3 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 7 Section "Through-Penetration Firestop Systems."

3.4 FIELD QUALITY CONTROL

A. Inspect installed sleeve and sleeve-seal installations and associated firestopping for damage and faulty work.

END OF SECTION 260500

SECTION 260519 – LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Building wires and cables rated 600 V and less.
2. Connectors, splices, and terminations rated 600 V and less.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Alcan Products Corporation; Alcan Cable Division.
2. American Insulated Wire Corp.; a Leviton Company.
3. General Cable Corporation.
4. Senator Wire & Cable Company.
5. Southwire Company.

B. Copper Conductors: Comply with NEMA WC 70.

C. Conductor Insulation: Comply with NEMA WC 70 for Types THHN-THWN and SO.

D. Multiconductor Cable: Comply with NEMA WC 70 for metal-clad cable, Type MC and Type SO with ground wire.

2.2 CONNECTORS AND SPLICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AFC Cable Systems, Inc.
2. Hubbell Power Systems, Inc.
3. O-Z/Gedney; EGS Electrical Group LLC.
4. 3M; Electrical Products Division.
5. Tyco Electronics Corp.

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Service Entrance: Type THHN-THWN, single conductors in raceway.

B. Exposed Feeders: Type THHN-THWN, single conductors in raceway.

C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces: Type THHN-THWN, single conductors in raceway.

D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN, single conductors in raceway.

E. Exposed Branch Circuits, Including in Crawlspaces: Type THHN-THWN, single conductors in raceway.

F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: All home runs shall be Type THHN-THWN, single conductors in raceway.

G. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN, single conductors in raceway.

H. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.

I. Class 1 Control Circuits: Type THHN-THWN, in raceway.

J. Class 2 Control Circuits: Type THHN-THWN, in raceway or power-limited tray cable, in cable tray, unless otherwise noted on drawings.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.

B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

E. Support cables according to Division 26 Section "Vibration And Seismic Controls For Electrical Systems."

F. Identify and color-code conductors and cables according to Division 26 Section "Identification For Electrical Systems."

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

C. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches of slack.

3.5 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Division 7 Section "Through-Penetration Firestop Systems."

3.6 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. After installing conductors and cables and before electrical circuitry has been energized, test for compliance with requirements.

2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

C. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION 260519

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes methods and materials for grounding systems and equipment.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Other Informational Submittals: Plans showing dimensioned as-built locations of grounding features specified in Part 3 "Field Quality Control" Article, including the following:

1. Test wells.
2. Ground rods.
3. Grounding arrangements and connections for separately derived systems.

C. Field quality-control test reports.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 CONDUCTORS

A. Insulated Conductors: Copper or tinned-copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:

1. Solid Conductors: ASTM B 3.
2. Stranded Conductors: ASTM B 8.
3. Tinned Conductors: ASTM B 33.
4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
6. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

C. Grounding Bus: Rectangular bars of annealed copper, as indicated and detailed on the drawings; with insulators.

2.2 CONNECTORS

A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.

B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type, with at least two bolts.

1. Pipe Connectors: Clamp type, sized for pipe.

C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

2.3 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad steel; 3/4 inch by 10 feet in diameter.

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger, unless otherwise indicated.

B. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 2/0 AWG minimum.

1. Bury at least 24 inches below grade.

C. Grounding Bus: Install in electrical and telephone equipment rooms, in rooms housing service equipment, and elsewhere as indicated.

1. Install bus on insulated spacers 1 inch, minimum, from wall 20 inches above finished floor, unless otherwise indicated.

D. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Underground Connections: Welded connectors, except at test wells and as otherwise indicated.
3. Connections to Ground Rods at Test Wells: Bolted connectors.
4. Connections to Structural Steel: Welded connectors.

3.2 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Signal and Communication Equipment: For telephone, alarm, voice and data, and other communication equipment, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.

1. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-2-by-12-inch grounding bus.
2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

C. Metal Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.3 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade, unless otherwise indicated.

1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating, if any.

C. Test Wells: Ground rod driven through drilled hole in bottom of handhole. Handholes are specified in Division 33 Section "Underground Ducts and Utility Structures," and shall be at least 12 inches deep, with cover.

1. Test Wells: Install at least one test well for each service, unless otherwise indicated. Install at the ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.

D. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly mounted equipment.
3. Use exothermic-welded connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.

E. Grounding and Bonding for Piping:

1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes, using a bolted clamp connector or by bolting a lug-type connector to a pipe flange, using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

F. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet apart.

G. Ufer Ground (Concrete-Encased Grounding Electrode): Fabricate according to NFPA 70, using a minimum of 20 feet of bare copper conductor not smaller than No. 4 AWG.

1. Bond grounding conductor to reinforcing steel in at least four locations and to anchor bolts. Extend grounding conductor below grade and connect to building grounding grid or to grounding electrode external to concrete.

3.4 FIELD QUALITY CONTROL

A. Perform the following tests and inspections and prepare test reports:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, at ground test wells, and at individual ground rods. Make tests at ground rods before any conductors are connected.

a. Measure ground resistance not less than two full days after last trace of precipitation and without soil being moistened by any means other than

natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.

b. Perform tests by fall-of-potential method according to IEEE 81.

3. Prepare dimensioned drawings locating each test well, ground rod and ground rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

B. Report measured ground resistances that exceed the following values:

1. Power and Lighting Equipment or System with Capacity 500 kVA and Less: 10 ohms.
2. Power and Lighting Equipment or System with Capacity 500 to 1000 kVA: 5 ohms.
3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
4. Power Distribution Units or Panelboards Serving Electronic Equipment: 3 ohm(s).

C. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 260526

SECTION 260533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

B. Related Sections include the following:

1. Division 7 Section "Through-Penetration Firestop Systems" for firestopping materials and installation at penetrations through walls, ceilings, and other fire-rated elements.
2. Division 26 Section “Vibration And Seismic Controls For Electrical Systems” for seismic restraints and bracing of raceways, boxes, enclosures, and cabinets.
3. Division 26 Section "Wiring Devices" for devices installed in boxes and for floor-box service fittings.

1.3 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. FMC: Flexible metal conduit.

C. IMC: Intermediate metal conduit.

D. LFMC: Liquidtight flexible metal conduit.

E. RNC: Rigid nonmetallic conduit.

1.4 SUBMITTALS

A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

1.6 COORDINATION

A. Coordinate layout and installation of raceways, boxes, enclosures, cabinets, and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 METAL CONDUIT AND TUBING

A. Manufacturers:

1. AFC Cable Systems, Inc.
2. Alflex Inc.
3. Anamet Electrical, Inc.; Anaconda Metal Hose.
4. Electri-Flex Co.
5. Grinnell Co./Tyco International; Allied Tube and Conduit Div.
6. LTV Steel Tubular Products Company.
7. Manhattan/CDT/Cole-Flex.
8. O-Z Gedney; Unit of General Signal.
9. Wheatland Tube Co.

B. Rigid Steel Conduit: ANSI C80.1.

C. IMC: ANSI C80.6.

D. EMT and Fittings: ANSI C80.3.

1. Fittings: Set-screw or compression type.

E. FMC: Zinc-coated steel.

F. LFMC: Flexible steel conduit with PVC jacket.

G. Fittings: NEMA FB 1; compatible with conduit and tubing materials.

2.3 NONMETALLIC CONDUIT AND TUBING

A. Manufacturers:

1. American International.
2. Anamet Electrical, Inc.; Anaconda Metal Hose.
3. Arnco Corp.
4. Cantex Inc.
5. Certainteed Corp.; Pipe & Plastics Group.
6. Condux International.
7. ElecSYS, Inc.
8. Electri-Flex Co.
9. Lamson & Sessions; Carlon Electrical Products.
10. Manhattan/CDT/Cole-Flex.
11. RACO; Division of Hubbell, Inc.
12. Spiralduct, Inc./AFC Cable Systems, Inc.
13. Thomas & Betts Corporation.

B. RNC: NEMA TC 2, Schedule 40 and Schedule 80 PVC.

C. RNC Fittings: NEMA TC 3; match to conduit or tubing type and material.

2.4 METAL WIREWAYS

A. Manufacturers:

1. Hoffman.
2. Square D.

B. Material and Construction: Sheet metal sized and shaped as indicated, NEMA 3R.

C. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

D. Select features, unless otherwise indicated, as required to complete wiring system and to comply with NFPA 70.

E. Wireway Covers: Hinged type.

F. Finish: Manufacturer's standard enamel finish.

2.5 SURFACE RACEWAYS

A. Surface Metal Raceways: Galvanized steel with snap-on covers. Finish with manufacturer's standard prime coating.

1. Manufacturers:

a. Wiremold Company (The).
b. Thomas & Betts Corporation.

B. Surface Nonmetallic Raceways: Two-piece construction, manufactured of rigid PVC compound with matte texture and manufacturer's standard color to be selected by the Architect.

1. Manufacturers:

a. Panduit Corp.
b. Wiremold Company.

C. Types, sizes, and channels as indicated and required for each application, with fittings that match and mate with raceways.

2.6 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers:

1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
2. Emerson/General Signal; Appleton Electric Company.
3. Erickson Electrical Equipment Co.
4. Hoffman.
5. Hubbell, Inc.; Killark Electric Manufacturing Co.
6. O-Z/Gedney; Unit of General Signal.
7. RACO; Division of Hubbell, Inc.
8. Robroy Industries, Inc.; Enclosure Division.
9. Scott Fetzer Co.; Adalet-PLM Division.
10. Spring City Electrical Manufacturing Co.
11. Thomas & Betts Corporation.
12. Walker Systems, Inc.; Wiremold Company (The).
13. Woodhead, Daniel Company; Woodhead Industries, Inc. Subsidiary.

B. Sheet Metal Outlet and Device Boxes: NEMA OS 1.

C. Cast-Metal Outlet and Device Boxes: NEMA FB 1, Type FD, with gasketed cover.

D. Floor Boxes: As specified on drawings.

E. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

F. Cast-Metal Pull and Junction Boxes: NEMA FB 1, cast aluminum with gasketed cover.

G. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous hinge cover and flush latch.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.

H. Cabinets: NEMA 250, Type 1, galvanized steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel. Hinged door in front cover with flush latch and concealed hinge. Key latch to match panelboards. Include metal barriers to separate wiring of different systems and voltage and include accessory feet where required for freestanding equipment.

2.7 FACTORY FINISHES

A. Finish: For raceway, enclosure, or cabinet components, provide manufacturer's standard color to be selected by Architect. Paint applied to factory-assembled surface raceways, enclosures, and cabinets before shipping.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors:

1. Exposed: Rigid steel or IMC.
2. Concealed: Rigid steel or IMC.
3. Underground, Single Run: RNC.
4. Underground, Grouped: RNC.
5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
6. Boxes and Enclosures: NEMA 250, Type 3R.

B. Indoors:

1. Exposed: EMT.
2. Concealed: EMT.
3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC; except use LFMC in damp or wet locations.
4. Damp or Wet Locations: Rigid steel conduit.
5. Boxes and Enclosures: NEMA 250, Type 1, except as follows:

a. Damp or Wet Locations: NEMA 250, Type 4, stainless steel.

C. Minimum Raceway Size: 3/4-inch trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.

3.2 INSTALLATION

A. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

B. Complete raceway installation before starting conductor installation.

C. Support raceways as specified in Division 26 Section "Vibration And Seismic Controls For Electrical Systems."

D. Install temporary closures to prevent foreign matter from entering raceways.

E. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portions of bends are not visible above the finished slab.

F. Make bends and offsets so ID is not reduced. Keep legs of bends in the same plane and keep straight legs of offsets parallel, unless otherwise indicated.

G. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.

1. Install concealed raceways with a minimum of bends in the shortest practical distance, considering type of building construction and obstructions, unless otherwise indicated.

H. Raceways Embedded in Slabs: Do not install raceways embedded in slabs.

I. Install exposed raceways parallel or at right angles to nearby surfaces or structural members and follow surface contours as much as possible.

1. Run parallel or banked raceways together on common supports.
2. Make parallel bends in parallel or banked runs. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.

J. Join raceways with fittings designed and approved for that purpose and make joints tight.

1. Use insulating bushings to protect conductors.

K. Tighten set screws of threadless fittings with suitable tools.

L. Terminations:

1. Where raceways are terminated with locknuts and bushings, align raceways to enter squarely and install locknuts with dished part against box. Use two locknuts, one inside and one outside box.

2. Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into hub so end bears against wire protection shoulder. Where chase nipples are used, align raceways so coupling is square to box; tighten chase nipple so no threads are exposed.

M. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.

N. Telephone and Signal System Raceways, 2-Inch Trade Size and Smaller: In addition to above requirements, install raceways in maximum lengths of 150 feet and with a maximum of two 90-degree bends or equivalent. Separate lengths with pull or junction boxes where necessary to comply with these requirements.

O. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where otherwise required by NFPA 70.

P. Stub-up Connections: Extend conduits through concrete floor for connection to freestanding equipment. Install with an adjustable top or coupling threaded inside for plugs set flush with finished floor. Extend conductors to equipment with rigid steel conduit; FMC may be used 6 inches above the floor. Install screwdriver-operated, threaded plugs flush with floor for future equipment connections.

Q. Flexible Connections: Use maximum of 72 inches of flexible conduit for recessed and semirecessed lighting fixtures; for equipment subject to vibration, noise transmission, or movement; and for all motors. Use LFMC in damp or wet locations. Install separate ground conductor across flexible connections.

R. Surface Raceways: Install a separate, green, ground conductor in raceways from junction box supplying raceways to receptacle or fixture ground terminals.

S. Set floor boxes level and flush with finished floor surface.

T. Install hinged-cover enclosures and cabinets plumb. Support at each corner.

3.3 PROTECTION

A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.4 CLEANING

A. After completing installation of exposed, factory-finished raceways and boxes, inspect exposed finishes and repair damaged finishes.

END OF SECTION 260533

SECTION 260548 – VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Hangers and supports for electrical equipment and systems.
2. Seismic restraints for electrical equipment and systems.

1.2 QUALITY ASSURANCE

A. Comply with seismic-restraint requirements in the IBC unless requirements in this Section are more stringent.

1.3 PROJECT CONDITIONS

A. Site Class as Defined in the IBC: Verify with Structural Engineer of Record.

B. S_s, Mapped Maximum Considered Earthquake Spectral Response at Short Periods: Verify with Structural Engineer of Record.

C. S_1, Mapped Maximum Considered Earthquake Spectral Response at 1-Second Period: Verify with Structural Engineer of Record.

D. Assigned Seismic Use Group or Building Category as Defined in the IBC: Verify with Structural Engineer of Record.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed under this Project, with a minimum structural safety factor of five times the applied force.

B. Steel Slotted Support Systems: Comply with MFMA-3, factory-fabricated components for field assembly, and provide finish suitable for the environment in which installed.

1. Manufacturers:

a. Cooper B-Line; a division of Cooper Industries.
b. ERICO International Corporation.
c. Allied Support Systems; Power-Strut Unit.
d. GS Metals Corp.
e. Michigan Hanger Co., Inc.; O-Strut Div.
f. National Pipe Hanger Corp.
g. Thomas & Betts Corporation.
h. Unistrut; Tyco International, Ltd.
i. Wesanco, Inc.

2. Channel Dimensions: Selected for structural loading and applicable seismic forces.

C. Raceway and Cable Supports: As described in NECA 1.

D. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

E. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.

F. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

G. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.

a. Manufacturers:

1) Cooper B-Line; a division of Cooper Industries.
2) Empire Tool and Manufacturing Co., Inc.
3) Hilti, Inc.
4) ITW Construction Products.
5) MKT Fastening, LLC.
6) Powers Fasteners.

2. Concrete Inserts: Steel or malleable-iron slotted-support-system units similar to MSS Type 18; complying with MFMA-3 or MSS SP-58.

3. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
4. Through Bolts: Structural type, hex head, high strength. Comply with ASTM A 325.
5. Toggle Bolts: All-steel springhead type.
6. Hanger Rods: Threaded steel.

2.3 SEISMIC-RESTRAINT COMPONENTS

A. Rated Strength, Features, and Application Requirements for Restraint Components: As defined in reports by an agency acceptable to authorities having jurisdiction.

1. Structural Safety Factor: Strength in tension, shear, and pullout force of components used shall be at least five times the maximum seismic forces to which they will be subjected.

B. Angle and Channel-Type Brace Assemblies: Steel angles or steel slotted-support-system components; with accessories for attachment to braced component at one end and to building structure at the other end.

1. Manufacturers:

a. Amber/Booth Company, Inc.
b. Loos & Co., Inc.
c. Mason Industries, Inc.

2. Seismic Mountings, Anchors, and Attachments: Devices as specified in Part 2 "Support, Anchorage, and Attachment Components" Article, selected to resist seismic forces.
3. Hanger Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections to hanger rod, of design recognized by an agency acceptable to authorities having jurisdiction.
4. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for seismically rated rigid equipment mountings, and matched to type and size of attachment devices used.

2.4 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

B. Materials: Comply with requirements in Division 5 Section "Metal Fabrications" for steel shapes and plates.

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with NECA 1 for application of hangers and supports for electrical equipment and systems, unless requirements in this Section or applicable Code are stricter.

3.2 SUPPORT AND SEISMIC-RESTRAINT INSTALLATION

A. Comply with NECA 1 for installation requirements, except as specified in this Article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70.

C. Install seismic-restraint components using methods approved by the evaluation service providing required submittals for component.

D. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static and seismic loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

E. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods, unless otherwise indicated by Code:

1. To Wood: Fasten with lag screws or through bolts.
2. To New Concrete: Bolt to concrete inserts.
3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
4. To Existing Concrete: Expansion anchor fasteners.
5. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.
6. To Light Steel: Sheet metal screws.
7. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount on slotted-channel racks attached to substrate.

F. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Comply with installation requirements in Division 5 Section "Metal Fabrications" for site-fabricated metal supports.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

C. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 INSTALLATION OF SEISMIC-RESTRAINT COMPONENTS

A. Install bushing assemblies for anchor bolts for floor-mounted equipment, arranged to provide resilient media between anchor bolt and mounting hole in concrete base.

B. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.

C. Restraint Cables: Provide slack within maximums recommended by manufacturer.

D. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, upper truss chords of bar joists, or at concrete members.

3.5 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

A. Make flexible connections in runs of raceways, cables, wireways, cable trays, and busways where they cross expansion and seismic-control joints, where adjacent sections or branches are supported by different structural elements, and where they terminate with connection to electrical equipment that is anchored to a different structural element from the one supporting them as they approach equipment.

END OF SECTION 260548

SECTION 260553 – IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Identification for conductors and communication and control cable.
2. Underground-line warning tape.
3. Instruction signs.
4. Equipment identification labels.
5. Miscellaneous identification products.

1.3 QUALITY ASSURANCE

A. Comply with ANSI A13.1 and ANSI C2.

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.145.

1.4 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in the Contract Documents, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual, and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

C. Coordinate installation of identifying devices with location of access panels and doors.

D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 CONDUCTOR AND COMMUNICATION- AND CONTROL-CABLE IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.

B. Write-On Tags: Polyester tag, 0.010 inch thick, with corrosion-resistant grommet and polyester or nylon tie for attachment to conductor or cable.

1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.

2.2 UNDERGROUND-LINE WARNING TAPE

A. Description: Permanent, bright-colored, continuous-printed, polyethylene tape.

1. Not less than 6 inches wide by 4 mils thick.
2. Compounded for permanent direct-burial service.
3. Embedded continuous metallic strip or core.
4. Printed legend shall indicate type of underground line.

2.3 INSTRUCTION SIGNS

A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch thick for signs up to 20 sq. in. and 1/8 inch thick for larger sizes.

1. Engraved legend with black letters on white face.
2. Punched or drilled for mechanical fasteners.
3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.4 EQUIPMENT IDENTIFICATION LABELS

A. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Letter height shall be 3/16 inch.

B. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch.

C. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8 inch.

2.5 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

B. Cable Ties: Fungus-inert, self-extinguishing, 1-piece, self-locking, Type 6/6 nylon cable ties.

1. Minimum Width: 3/16 inch.
2. Tensile Strength: 50 lb, minimum.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: Black, except where used for color-coding.

PART 3 - EXECUTION

3.1 APPLICATION

A. Power-Circuit Conductor Identification: For secondary conductors No. 1/0 AWG and larger in vaults, pull and junction boxes, manholes, and handholes use color-coding conductor tape. Identify source and circuit number of each set of conductors. For single conductor cables, identify phase in addition to the above.

B. Branch-Circuit Conductor Identification: Where there are conductors for more than three branch circuits in same junction or pull box, use write-on tags. Identify each ungrounded conductor according to source and circuit number.

C. Conductors to Be Extended in the Future: Attach write-on tags to conductors and list source and circuit number.

D. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, signal, sound, intercommunications, voice, and data connections.

1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and Operation and Maintenance Manual.

E. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable. Install underground-line warning tape for both direct-buried cables and cables in raceway.

F. Instruction Signs:

1. Operating Instructions: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.

G. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

1. Labeling Instructions:

a. Indoor Equipment: Self-adhesive, engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on 1-1/2-inch- high label; where 2 lines of text are required, use labels 2 inches high.
b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.

2. Equipment to Be Labeled:

a. Panelboards, electrical cabinets, and enclosures.
b. Access doors and panels for concealed electrical items.
c. Electrical switchgear and switchboards.
d. Motor-control centers.
e. Disconnect switches.
f. Enclosed circuit breakers.
g. Motor starters.
h. Push-button stations.
i. Contactors.
j. Remote-controlled switches, dimmer modules, and control devices.
k. Electrical receptacles.
l. Light switches.
m. Wall mounted occupancy sensors.
n. Ceiling mounted occupancy sensors in restrooms.

3.2 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

E. Attach nonadhesive signs and plastic labels with screws and auxiliary hardware appropriate to the location and substrate.

F. Color-Coding for Phase Identification, 600 V and Less: Use the colors listed below for ungrounded service, feeder, and branch-circuit conductors.

1. Color shall be factory applied or, for sizes larger than No. 10 AWG if authorities having jurisdiction permit, field applied.

2. Colors for 208/120-V Circuits:

a. Phase A: Black.
b. Phase B: Red.
c. Phase C: Blue.

3. Colors for 480/277-V Circuits:

a. Phase A: Brown.
b. Phase B: Orange.
c. Phase C: Yellow.

4. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

G. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trenchexceeds 16 inches overall.

END OF SECTION 260553

SECTION 16055 - OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes computer-based, fault-current and overcurrent protective device coordination studies. Protective devices shall be set based on results of the protective device coordination study.

1. Coordination of series-rated devices is permitted where indicated on Drawings.

1.3 SUBMITTALS

A. Product Data: For computer software program to be used for studies.

B. Product Certificates: For coordination-study and fault-current-study computer software programs, certifying compliance with IEEE 399.

C. Qualification Data: For coordination-study specialist.

D. Other Action Submittals: The following submittals shall be made after the approval process for system protective devices has been completed. Submittals shall be in digital form.

1. Coordination-study input data, including completed computer program input data sheets.
2. Study and Equipment Evaluation Reports.
3. Coordination-Study Report.

1.4 QUALITY ASSURANCE

A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with requirements of standards and guides specified in this Section. Manual calculations are not acceptable.

B. Coordination-Study Specialist Qualifications: An entity experienced in the application of computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices.

1. Professional engineer, licensed in the state where Project is located, shall be responsible for the study. All elements of the study shall be performed under the direct supervision and control of engineer.

C. Comply with IEEE 242 for short-circuit currents and coordination time intervals.

D. Comply with IEEE 399 for general study procedures.

PART 2 - PRODUCTS

2.1 COMPUTER SOFTWARE DEVELOPERS

A. Available Computer Software Developers: Subject to compliance with requirements, companies offering computer software programs that may be used in the Work include, but are not limited to, the following:

B. Computer Software Developers: Subject to compliance with requirements, provide products by one of the following:

C. Basis-of-Design Product: Subject to compliance with requirements, provide or a comparable product by one of the following:

1. CGI CYME.
2. EDSA Micro Corporation.
3. ESA Inc.
4. Operation Technology, Inc.
5. SKM Systems Analysis, Inc.

2.2 COMPUTER SOFTWARE PROGRAM REQUIREMENTS

A. Comply with IEEE 399.

B. Analytical features of fault-current-study computer software program shall include "mandatory," "very desirable," and "desirable" features as listed in IEEE 399.

C. Computer software program shall be capable of plotting and diagramming time-current-characteristic curves as part of its output. Computer software program shall report device settings and ratings of all overcurrent protective devices and shall demonstrate selective coordination by computer-generated, time-current coordination plots.

1. Optional Features:

a. Arcing faults.
b. Simultaneous faults.
c. Explicit negative sequence.
d. Mutual coupling in zero sequence.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine Project overcurrent protective device submittals for compliance with electrical distribution system coordination requirements and other conditions affecting performance. Devices to be coordinated are indicated on Drawings.

1. Proceed with coordination study only after relevant equipment submittals have been assembled. Overcurrent protective devices that have not been submitted and approved prior to coordination study may not be used in study.

3.2 POWER SYSTEM DATA

A. Gather and tabulate the following input data to support coordination study:

1. Product Data for overcurrent protective devices specified in other Division 26 Sections and involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.
2. Impedance of utility service entrance.
3. Electrical Distribution System Diagram: In hard-copy and electronic-copy formats, showing the following:

    a. Circuit-breaker and fuse-current ratings and types.
    b. Transformer kilovolt amperes, primary and secondary voltages, connection type, impedance, and X/R ratios.
    c. Generator kilovolt amperes, size, voltage, and source impedance.
    d. Cables: Indicate conduit material, sizes of conductors, conductor material, insulation, and length.
    e. Busway ampacity and impedance.
    f. Motor horsepower and code letter designation according to NEMA MG 1.

4. Data sheets to supplement electrical distribution system diagram, cross-referenced with tag numbers on diagram, showing the following:

    a. Special load considerations, including starting inrush currents and frequent starting and stopping.
    b. Transformer characteristics, including primary protective device, magnetic inrush current, and overload capability.
    c. Motor full-load current, locked rotor current, service factor, starting time, type of start, and thermal-damage curve.
    d. Generator thermal-damage curve.
    e. Ratings, types, and settings of utility company's overcurrent protective devices.
    f. Special overcurrent protective device settings or types stipulated by utility company.
    g. Time-current-characteristic curves of devices indicated to be coordinated.

h. Manufacturer, frame size, interrupting rating in amperes rms symmetrical, ampere or current sensor rating, long-time adjustment range, short-time adjustment range, and instantaneous adjustment range for circuit breakers.
i. Manufacturer and type, ampere-tap adjustment range, time-delay adjustment range, instantaneous attachment adjustment range, and current transformer ratio for overcurrent relays.
j. Panelboards, switchboards, motor-control center ampacity, and interrupting rating in amperes rms symmetrical.

3.3 FAULT-CURRENT STUDY

A. Calculate the maximum available short-circuit current in amperes rms symmetrical at circuit-breaker positions of the electrical power distribution system. The calculation shall be for a current immediately after initiation and for a three-phase bolted short circuit at each of the following:

1. Switchgear and switchboard bus.
2. Medium-voltage controller.
3. Motor-control center.
4. Distribution panelboard.
5. Branch circuit panelboard.

B. Study electrical distribution system from normal and alternate power sources throughout electrical distribution system for Project. Include studies of system-switching configurations and alternate operations that could result in maximum fault conditions.

C. Calculate momentary and interrupting duties on the basis of maximum available fault current.

D. Calculations to verify interrupting ratings of overcurrent protective devices shall comply with IEEE 241 and IEEE 242.

1. Transformers:

a. ANSI C57.12.10.
b. ANSI C57.12.22.
c. ANSI C57.12.40.
d. IEEE C57.12.00.
e. IEEE C57.96.

2. Medium-Voltage Circuit Breakers: IEEE C37.010.
3. Low-Voltage Circuit Breakers: IEEE 1015 and IEEE C37.20.1.
4. Low-Voltage Fuses: IEEE C37.46.

E. Study Report:

1. Show calculated X/R ratios and equipment interrupting rating (1/2-cycle) fault currents on electrical distribution system diagram.

2. Show interrupting (5-cycle) and time-delayed currents (6 cycles and above) on medium-voltage breakers as needed to set relays and assess the sensitivity of overcurrent relays.

F. Equipment Evaluation Report:

1. For 600-V overcurrent protective devices, ensure that interrupting ratings are equal to or higher than calculated 1/2-cycle symmetrical fault current.
2. For devices and equipment rated for asymmetrical fault current, apply multiplication factors listed in the standards to 1/2-cycle symmetrical fault current.
3. Verify adequacy of phase conductors at maximum three-phase bolted fault currents; verify adequacy of equipment grounding conductors and grounding electrode conductors at maximum ground-fault currents. Ensure that short-circuit withstand ratings are equal to or higher than calculated 1/2-cycle symmetrical fault current.

3.4 COORDINATION STUDY

A. Perform coordination study using approved computer software program. Prepare a written report using results of fault-current study. Comply with IEEE 399.

1. Calculate the maximum and minimum 1/2-cycle short-circuit currents.
2. Calculate the maximum and minimum interrupting duty (5 cycles to 2 seconds) short-circuit currents.
3. Calculate the maximum and minimum ground-fault currents.

B. Comply with IEEE 241 IEEE 242 recommendations for fault currents and time intervals.

C. Transformer Primary Overcurrent Protective Devices:

1. Device shall not operate in response to the following:

a. Inrush current when first energized.
b. Self-cooled, full-load current or forced-air-cooled, full-load current, whichever is specified for that transformer.
c. Permissible transformer overloads according to IEEE C57.96 if required by unusual loading or emergency conditions.

2. Device settings shall protect transformers according to IEEE C57.12.00, for fault currents.

D. Motors served by voltages more than 600 V shall be protected according to IEEE 620.

E. Conductor Protection: Protect cables against damage from fault currents according to ICEA P-32-382, ICEA P-45-482, and conductor melting curves in IEEE 242. Demonstrate that equipment withstands the maximum short-circuit current for a time equivalent to the tripping time of the primary relay protection or total clearing time of the fuse. To determine temperatures that damage insulation, use curves from cable manufacturers or from listed standards indicating conductor size and short-circuit current.

F. Coordination-Study Report: Prepare a written report indicating the following results of coordination study:

1. Tabular Format of Settings Selected for Overcurrent Protective Devices:

   a. Device tag.
   b. Relay-current transformer ratios; and tap, time-dial, and instantaneous-pickup values.
   c. Circuit-breaker sensor rating; and long-time, short-time, and instantaneous settings.
   d. Fuse-current rating and type.
   e. Ground-fault relay-pickup and time-delay settings.

2. Coordination Curves: Prepared to determine settings of overcurrent protective devices to achieve selective coordination. Graphically illustrate that adequate time separation exists between devices installed in series, including power utility company's upstream devices. Prepare separate sets of curves for the switching schemes and for emergency periods where the power source is local generation. Show the following information:

   a. Device tag.
   b. Voltage and current ratio for curves.
   c. Three-phase and single-phase damage points for each transformer.
   d. No damage, melting, and clearing curves for fuses.
   e. Cable damage curves.
   f. Transformer inrush points.
   g. Maximum fault-current cutoff point.

G. Completed data sheets for setting of overcurrent protective devices.

END OF SECTION 260573

SECTION 262726 - WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Single and duplex receptacles, and ground-fault circuit interrupters.
2. Single- and double-pole snap switches and dimmer switches.
3. Device wall plates.
4. Floor service outlets.

1.3 DEFINITIONS

A. EMI: Electromagnetic interference.

B. GFCI: Ground-fault circuit interrupter.

C. PVC: Polyvinyl chloride.

D. RFI: Radio-frequency interference.

E. UTP: Unshielded twisted pair.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: List of legends and description of materials and process used for pre-marking wall plates.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of wiring device through one source from a single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with NFPA 70.

1.6 COORDINATION

A. Receptacles for Owner-Furnished Equipment: Match plug configurations.

1. Cord and Plug Sets: Match equipment requirements.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Floor Service Outlet Assemblies: One for every 10, but no fewer than one.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Wiring Devices:

a. Bryant Electric, Inc./Hubbell Subsidiary.
b. Eagle Electric Manufacturing Co., Inc.
c. Hubbell Incorporated; Wiring Device-Kellems.
d. Leviton Mfg. Company Inc.
e. Pass & Seymour/Legrand; Wiring Devices Div.

2. Poke-Through, Floor Service Outlets and Telephone/Power Poles:

a. Wiremold Company (The).

2.2 RECEPTACLES

A. Straight-Blade-Type Receptacles: Comply with NEMA WD 1, NEMA WD 6, DSCC W-C-596G, and UL 498.

B. Straight-Blade and Locking Receptacles: Heavy-Duty grade.

C. GFCI Receptacles: Straight blade, feed-through type, Heavy-Duty grade, with integral NEMA WD 6, Configuration 5-20R duplex receptacle; complying with UL 498 and UL 943. Design units for installation in a 2-3/4-inch- deep outlet box without an adapter.

2.3 PENDANT CORD/CONNECTOR DEVICES

A. Description: Matching, locking-type plug and receptacle body connector, NEMA WD 6, Configurations L5-20P and L5-20R, Heavy-Duty grade.

1. Body: Nylon with screw-open cable-gripping jaws and provision for attaching external cable grip.
2. External Cable Grip: Woven wire-mesh type made of high-strength galvanized-steel wire strand, matched to cable diameter, and with attachment provision designed for corresponding connector.

2.4 CORD AND PLUG SETS

A. Description: Match voltage and current ratings and number of conductors to requirements of equipment being connected.

1. Cord: Rubber-insulated, stranded-copper conductors, with Type SOW-A jacket; with green-insulated grounding conductor and equipment-rating ampacity plus a minimum of 30 percent.
2. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

2.5 SWITCHES

A. Single- and Double-Pole Switches: Comply with DSCC W-C-896F and UL 20.

B. Snap Switches: Heavy-Duty grade, quiet type.

C. Dimmer Switches: Modular, full-wave, solid-state units with integral, quiet on/off switches and audible frequency and EMI/RFI filters.

1. Control: Continuously adjustable slider; with single-pole or three-way switching to suit connections.
2. Incandescent Lamp Dimmers: Modular, 120 V, 60 Hz with continuously adjustable rotary knob, toggle switch, or slider; single pole with soft tap or other quiet switch; EMI/RFI filter to eliminate interference; and 5-inch wire connecting leads.
3. Fluorescent Lamp Dimmer Switches: Modular; compatible with dimmer ballasts; trim potentiometer to adjust low-end dimming; dimmer-ballast combination capable of consistent dimming with low end not greater than 20 percent of full brightness.

2.6 WALL PLATES

A. Single and combination types to match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for Finished Spaces: 0.035-inch- thick, satin-finished stainless steel.
3. Material for Unfinished Spaces: Galvanized steel.
4. Material for Wet Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in "wet locations."

2.7 FLOOR SERVICE FITTINGS

A. Type: Modular, flush-type, dual-service units suitable for wiring method used.

B. Compartments: Barrier separates power from voice and data communication cabling.

C. Service Plate: Rectangular, brushed stainless steel.

D. Power Receptacle: NEMA WD 6, Configuration 5-20R, gray finish, unless otherwise indicated.

E. Voice and Data Communication Outlet: As indicated on drawings..

2.8 FINISHES

A. Color:

1. Wiring Devices Connected to Normal Power System: Gray, unless otherwise indicated or required by NFPA 70.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install devices and assemblies level, plumb, and square with building lines.

B. Install wall dimmers to achieve indicated rating after derating for ganging according to manufacturer's written instructions.

C. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' written instructions.

D. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical, and with grounding terminal of receptacles on top. Group adjacent switches under single, multi-gang wall plates.

E. Remove wall plates and protect devices and assemblies during painting.

F. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 IDENTIFICATION

A. Comply with Division 26 Section "Identification For Electrical Systems."

1. Receptacles: Identify panelboard and circuit number from which served. Use machine printed adhesive labels, clear with black letters.

3.3 CONNECTIONS

A. Ground equipment according to Division 26 Section "Grounding and Bonding For Electrical Systems."

B. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors And Cables."

C. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.4 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections and prepare test reports:

1. After installing wiring devices and after electrical circuitry has been energized, test for proper polarity, ground continuity, and compliance with requirements.
2. Test GFCI operation with both local and remote fault simulations according to manufacturer's written instructions.

B. Remove malfunctioning units, replace with new units, and retest as specified above.

END OF SECTION 262726

SECTION 262813 - FUSES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Cartridge fuses rated 600 V and less for use in switches.

1.2 SUBMITTALS

A. Product Data: For each fuse type indicated.

B. Operation and maintenance data.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NEMA FU 1.

C. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cooper Bussman, Inc.
2. Eagle Electric Mfg. Co., Inc.; Cooper Industries, Inc.
3. Ferraz Shawmut, Inc.
4. Tracor, Inc.; Littelfuse, Inc. Subsidiary.

2.2 CARTRIDGE FUSES

A. Characteristics: NEMA FU 1, nonrenewable cartridge fuse; class and current rating indicated; voltage rating consistent with circuit voltage.

PART 3 - EXECUTION

3.1 FUSE APPLICATIONS

A. Service Entrance: Class L, time delay.

B. Motor Branch Circuits: Class RK1, time delay.

3.2 INSTALLATION

A. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.

3.3 IDENTIFICATION

A. Install labels indicating fuse replacement information on inside door of each fused switch.

END OF SECTION 262813

SECTION 262816 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following individually mounted, enclosed switches and circuit breakers:

1. Fusible switches.
2. Nonfusible switches.
3. Molded-case circuit breakers.
4. Enclosures.

1.3 DEFINITIONS

A. GFCI: Ground-fault circuit interrupter.

B. HD: Heavy duty.

C. RMS: Root mean square.

D. SPDT: Single pole, double throw.

1.4 SUBMITTALS

A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

1. Enclosure types and details for types other than NEMA 250, Type 1.
2. Current and voltage ratings.
3. Short-circuit current rating.
4. UL listing for series rating of installed devices.
5. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.

B. Shop Drawings: Diagram power, signal, and control wiring.

C. Operation and Maintenance Data: For enclosed switches and circuit breakers to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Closeout Procedures" or "Operation and Maintenance Data," include the following:

1. Manufacturer's written instructions for testing and adjusting enclosed switches and circuit breakers.
2. Time-current curves, including selectable ranges for each type of circuit breaker.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

C. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.

1.6 COORDINATION

A. Coordinate layout and installation of switches, circuit breakers, and components with other construction, including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Spares: For the following:

a. Fuses for Fusible Switches: 2 of each size and type installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 FUSIBLE AND NONFUSIBLE SWITCHES

A. Manufacturers:

1. Eaton Corporation; Cutler-Hammer Products.
2. General Electric Co.; Electrical Distribution & Control Division.
3. Siemens Energy & Automation, Inc.
4. Square D/Group Schneider.

B. Fusible Switch, 600 A and Smaller: NEMA KS 1, Type HD, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.

C. Nonfusible Switch, 600 A and Smaller: NEMA KS 1, Type HD, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.

D. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper ground conductors.
2. Neutral Kit (If required by application): Internally mounted; insulated, capable of being grounded, and bonded; and labeled for copper and aluminum neutral conductors.
3. Auxiliary Contact Kit (Where indicated on drawings): Auxiliary set of contacts arranged to open before switch blades open.

2.3 MOLDED-CASE CIRCUIT BREAKERS AND SWITCHES

A. Manufacturers:

1. Eaton Corporation; Cutler-Hammer Products.
2. General Electric Co.; Electrical Distribution & Control Division.
3. Siemens Energy & Automation, Inc.
4. Square D/Group Schneider.

B. Molded-Case Circuit Breaker: NEMA AB 1, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
3. Electronic Trip-Unit Circuit Breakers: RMS sensing; field-replaceable rating plug; with the following field-adjustable settings:

a. Instantaneous trip.
b. Long- and short-time pickup levels.
c. Long- and short-time time adjustments.
d. Ground-fault pickup level, time delay, and I^2t response.

4. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller and let-through ratings less than NEMA FU 1, RK-5.
5. GFCI Circuit Breakers: Single- and two-pole configurations with mA trip sensitivity as indicated on drawings.

C. Molded-Case Circuit-Breaker Features and Accessories:

1. Standard frame sizes, trip ratings, and number of poles.
2. Lugs: Mechanical style suitable for number, size, trip ratings, and conductor material.
3. Application Listing: Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
4. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
5. Shunt Trip (Where indicated): 120-V trip coil energized from separate circuit, set to trip at 55 percent of rated voltage.
6. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage with field-adjustable 0.1- to 0.6-second time delay.

D. Molded-Case Switches: Molded-case circuit breaker with fixed, high-set instantaneous trip only, and short-circuit withstand rating equal to equivalent breaker frame size interrupting rating.

E. Molded-Case Switch Accessories:

1. Lugs: Mechanical style suitable for number, size, trip ratings, and material of conductors.
2. Application Listing: Type HACR for heating, air-conditioning, and refrigerating equipment.

2.4 ENCLOSURES

A. NEMA AB 1 and NEMA KS 1 to meet environmental conditions of installed location.

1. Outdoor Locations: NEMA 250, Type 3R.
2. Kitchen Areas: NEMA 250, Type 4X, stainless steel.
3. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with applicable portions of NECA 1, NEMA PB 1.1, and NEMA PB 2.1 for installation of enclosed switches and circuit breakers.

B. Mount individual wall-mounting switches and circuit breakers with tops at uniform height, unless otherwise indicated.

C. Comply with mounting and anchoring requirements specified in Division 26 Section "Electrical Supports and Seismic Restraints."

D. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

3.3 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 26 Section "Electrical Identification."

B. Enclosure Nameplates: Label each enclosure with engraved metal or laminated-plastic nameplate as specified in Division 26 Section "Electrical Identification."

3.4 FIELD QUALITY CONTROL

A. Prepare for acceptance testing as follows:

1. Inspect mechanical and electrical connections.
2. Verify switch and relay type and labeling verification.
3. Verify rating of installed fuses.
4. Inspect proper installation of type, size, quantity, and arrangement of mounting or anchorage devices complying with manufacturer's certification.

B. Perform the following field tests and inspections and prepare test reports:

1. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

3.5 ADJUSTING

A. Set field-adjustable switches and circuit-breaker trip ranges.

3.6 CLEANING

A. On completion of installation, vacuum dirt and debris from interiors; do not use compressed air to assist in cleaning.

B. Inspect exposed surfaces and repair damaged finishes.

END OF SECTION 262816

SECTION 262913 - ENCLOSED CONTROLLERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes ac, enclosed controllers rated 600 V and less, of the following types:

1. Across-the-line, magnetic controllers.

1.3 SUBMITTALS

A. Product Data: For each type of enclosed controller. Include dimensions and manufacturer's technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For each enclosed controller.

1. Include dimensioned plans, elevations, sections, and details, including required clearances and service space around equipment. Show tabulations of installed devices, equipment features, and ratings. Include the following:

a. Each installed unit's type and details.
b. Nameplate legends.
c. Short-circuit current rating of integrated unit.
d. Listed and labeled for series rating of overcurrent protective devices in combination controllers by an NRTL acceptable to authorities having jurisdiction.
e. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices in combination controllers.

2. Wiring Diagrams: Power, signal, and control wiring.

C. Operation and Maintenance Data: For enclosed controllers to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:

1. Routine maintenance requirements for enclosed controllers and all installed components.

2. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.

D. Load-Current and List of Settings of Adjustable Overload Relays: Compile after motors have been installed and arrange to demonstrate that dip switch settings for motor running overload protection suit actual motor to be protected.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer. Maintain, within 100 miles of Project site, a service center capable of providing training, parts, and emergency maintenance and repairs.

B. Source Limitations: Obtain enclosed controllers of a single type through one source from a single manufacturer.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

D. Comply with NFPA 70.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store enclosed controllers indoors in clean, dry space with uniform temperature to prevent condensation. Protect enclosed controllers from exposure to dirt, fumes, water, corrosive substances, and physical damage.

1.6 COORDINATION

A. Coordinate layout and installation of enclosed controllers with other construction including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Coordinate installation of roof curbs, equipment supports, and roof penetrations. These items are specified in Division 07 Section "Roof Accessories."

C. Coordinate features of enclosed controllers and accessory devices with pilot devices and control circuits to which they connect.

D. Coordinate features, accessories, and functions of each enclosed controller with ratings and characteristics of supply circuit, motor, required control sequence, and duty cycle of motor and load.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Spare Fuses: Furnish two spare for every size and type installed.
2. Indicating Lights: Two of each type installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Eaton Corporation; Cutler-Hammer Products.
2. General Electrical Company; GE Industrial Systems.
3. Siemens/Furnas Controls.
4. Square D.

2.2 ACROSS-THE-LINE ENCLOSED CONTROLLERS

A. Magnetic Controller: NEMA ICS 2, Class A, full voltage, nonreversing, across the line, unless otherwise indicated.

1. Control Circuit: 120 V; obtained from integral control power transformer with a control power transformer of sufficient capacity to operate connected pilot, indicating and control devices, plus 100 percent spare capacity.
2. Adjustable Overload Relay: Dip switch selectable for motor running overload protection with NEMA ICS 2, Class 10 tripping characteristic, and selected to protect motor against voltage and current unbalance and single phasing. Provide relay with Class II ground-fault protection, with start and run delays to prevent nuisance trip on starting.

B. Combination Magnetic Controller: Factory-assembled combination controller and disconnect switch.

1. Fusible Disconnecting Means: NEMA KS 1, heavy-duty, fusible switch with rejection-type fuse clips rated for fuses. Select and size fuses to provide Type 2 protection according to IEC 947-4-1, as certified by an NRTL.
2. Nonfusible Disconnecting Means: NEMA KS 1, heavy-duty, nonfusible switch.
3. Circuit-Breaker Disconnecting Means: NEMA AB 1, motor-circuit protector with field-adjustable, short-circuit trip coordinated with motor locked-rotor amperes.

2.3 ENCLOSURES

A. Description: Flush- or surface-mounting cabinets as indicated. NEMA 250, Type 1, unless otherwise indicated to comply with environmental conditions at installed location.

1. Outdoor Locations: NEMA 250, Type 3R.
2. Kitchen Areas: NEMA 250, Type 4X, stainless steel.
3. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.

2.4 ACCESSORIES

A. Devices shall be factory installed in controller enclosure, unless otherwise indicated.

B. Push-Button Stations, Pilot Lights, and Selector Switches: NEMA ICS 2, heavy-duty type.

C. Stop and Lockout Push-Button Station: Momentary-break, push-button station with a factory-applied hasp arranged so padlock can be used to lock push button in depressed position with control circuit open.

D. Control Relays: Auxiliary and adjustable time-delay relays.

E. Phase-Failure and Undervoltage Relays: Solid-state sensing circuit with isolated output contacts for hard-wired connection. Provide adjustable undervoltage setting.

2.5 FACTORY FINISHES

A. Finish: Manufacturer's standard gray paint applied to factory-assembled and -tested enclosed controllers before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and surfaces to receive enclosed controllers for compliance with requirements, installation tolerances, and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLICATIONS

A. Select features of each enclosed controller to coordinate with ratings and characteristics of supply circuit and motor; required control sequence; duty cycle of motor, controller, and load; and configuration of pilot device and control circuit affecting controller functions.

B. Select horsepower rating of controllers to suit motor controlled.

3.3 INSTALLATION

A. For control equipment at walls, bolt units to wall or mount on lightweight structural-steel channels bolted to wall. For controllers not at walls, provide freestanding racks complying with Division 26 Section "Vibration And Seismic Controls For Electrical Systems."

B. Comply with mounting and anchoring requirements specified in Division 26 Section "Vibration And Seismic Controls For Electrical Systems."

C. Enclosed Controller Fuses: Install fuses in each fusible switch. Comply with requirements in Division 26 Section "Fuses."

3.4 IDENTIFICATION

A. Identify enclosed controller, components, and control wiring according to Division 26 Section "Identification For Electrical Systems."

3.5 CONTROL WIRING INSTALLATION

A. Install wiring between enclosed controllers according to Division 26 Section "Low-Voltage Electrical Power Conductors And Cables."

B. Bundle, train, and support wiring in enclosures.

C. Connect hand-off-automatic switch and other automatic-control devices where applicable.

1. Connect selector switches to bypass only manual- and automatic-control devices that have no safety functions when switch is in hand position.
2. Connect selector switches with enclosed controller circuit in both hand and automatic positions for safety-type control devices such as low- and high-pressure cutouts, high-temperature cutouts, and motor overload protectors.

3.6 CONNECTIONS

A. Conduit installation requirements are specified in other Division 26 Sections. Drawings indicate general arrangement of conduit, fittings, and specialties.

B. Ground equipment according to Division 26 Section "Grounding and Bonding For Electrical Systems."

3.7 FIELD QUALITY CONTROL

A. Prepare for acceptance tests as follows:

1. Test insulation resistance for each enclosed controller element, bus, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.

B. Perform the following field tests and inspections and prepare test reports:

1. Perform each electrical test and visual and mechanical inspection, except optional tests, stated in NETA ATS, "Motor Control - Motor Starters." Certify compliance with test parameters.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

3.8 ADJUSTING

A. Set field-adjustable switches and circuit-breaker trip ranges.

END OF SECTION 16420

SECTION 281300 – ACCESS CONTROL

PART 1 - GENERAL

1.01 SYSTEM DESCRIPTION

The Security Management System specified shall be fully integrated and installed as a complete package by the Access/Security Control Contractor. The SMS shall be able to provide for and integrate (*as required*) the following subsystems:

- Integrated Access Control
- Alarm Monitoring
- Integrated Digital Video Management
- Interactive Alarm/Facility Graphics Display
- Wireless Alarm and Video Transmission
- Associated Access Control and Alarm Equipment Control
- Multiple Language Operation
- Multiple Tenant Operation
- Access Initiated and Event Initiated Control
- Elevator Control
- Workstation and associated equipment, as required.

The SMS shall be based upon a distributed system of fully intelligent, stand-alone controllers, operating in a multi-tasking, multi-user environment on a true peer-to-peer, token passing Local Area Network (LAN). The SMS shall be capable of monitoring, recording, and displaying card access activity and supervised alarm inputs/outputs on a continuous, real time basis. Each installation shall comply with local, state, and federal code requirements as applicable. The system shall be user friendly, providing a user interface that allows for training of non- technical personnel to effectively operate and administer the system.

The SMS shall be designed to provide a centralized location with the ability to monitor, control, view, and communicate from a secure location within a facility or within the facilities or systems network.

System expansion capability: Minimum 100% over specified requirements with no additional software or required software upgrades.

1.01A SYSTEM CAPACITIES

Total minimum number of Hosts: 1
Total number of concurrent hosts: 48
Total number of optional Backup Workstations: = total number of connected workstations
The password shall be user defined up to 127 characters
Support for up to 633,000 readers using either magnetic-strip, Wiegand, proximity, Biometrics, Pinpad technologies or user definable custom card formats.
Support for up to 6,120,000 unique ID records.
Support alarm monitoring of up to 1,638,400 supervised digital input points.
Support for 1,638,400 output control points
Support for 5,000,000 on-line transaction history records

Archive history limited only to hard disk space
Support for up to 1100 system passwords

The system shall allow for Alternate ID's to be pre-configured by a system administrator. These Alternate ID's shall carry pre-defined settings that will automatically be assigned to a new operator. Operators and Administrators shall have the ability to utilize their Windows log on as their default system log on.

Support for up to 10,000 unique graphics pages
Support for Ethernet Lan: TP (10 Base-T) Twisted pair, AUI (10 Bases) Thicknet, BNC (10 Base-2-default) Thinnet.

1.01B SYSTEM CAPABILITIES

The following functional capabilities are considered essential for the Security Management System (SMS) described in this specification:

A. Integrated Access Control
B. Intrusion Detection
C. Door Control
D. First Key Auto Unlock
E. Anti-Passback control
F. Alarm Assessment (Instructions)
G. Database Security And Encryption
H. Dynamic Maps Displaying Alarm Points
I. If/Then/and/or/not functions
J. Time Scheduled Events
K. Access Control initiated events
L. Windows Based, Mouse oriented operations
M. Dial – Up Alarm processing from remote locations
N. Dial – Up processing of Access Control functions for remote locations
O. Ability to Import and Export cardholder data
P. Comprehensive User Definable Reports
Q. Comprehensive User Definable Archiving
R. Integrated Digital Video Management
S. Integrated Video Badging
T. Visitor Management Module
U. Two Man Rule
V. Escort Privileges
W. Support for OPC, DDE and ODBC technologies
X. Ability to be WEB enabled

1.02 RELATED WORK

1.02A DOOR HARDWARE

Not specifically covered under this specification. It will be the responsibility of the individual bidder/contractor to provide and install all electric locking equipment including but not limited to electro-magnetic door locks, egress equipment, door status/alarm switches, and related power supplies. All electronic door hardware provided shall meet the local authority having jurisdiction for its intended use. Any code deficiencies associated with the system once installed will be left to the installing contractor to be replaced with the appropriate equipment.

1.02B WIRING / CABLE SPECIFICATIONS

All wiring for Distributed Control Unit communications and all wiring for related sub-LAN controller communications shall be Belden 9184 or equivalent. Belden 9841 or equivalent may be used for LAN lengths not exceeding 5000 ft. (1220m).

All other cable is to meet the following requirements as outlined below:

- UL Listed
- NEC approved
- Plenum rated where required

- All cabling shall be shielded unless specified otherwise by a card access manufacturer.
- As a minimum, standard 18 AWG cable shall be installed unless in direct conflict with manufacturers specifications
- All cabling used in the implementation of systems integration shall be in accordance with the recommendations of the manufacturer.

Provide specialist personnel for the complete wiring installation. Provide cables, conduits, cable tray and ancillary equipment necessary to complete the installation. Refer to Division 26 for additional requirements.

1.02C GROUNDING

Take particular attention to the grounding of equipment cases and shielded cables to eliminate noise interference and avoid electrical loops. **Provide shielded cable for all communications cabling**. Correctly terminate shields at ground bars and connect to the main building ground or as specified by the manufacturer.

- Insulate all incoming or outgoing shielded cables from control cabinet casings.
- Provide suitable terminals, where grounding of cable shields is required.
- Make provision of a through connection of cable shields for through connected communications cables.

1.02D SYSTEM SUPPORT

Provide a guarantee, in writing, of system support for a minimum period of six years after final completion, including provision for technical support, hardware, and spare parts. Demonstrate that the manufacturer's previous systems have not been made obsolete and that the manufacturer is committed to total and complete backward compatibility. System support shall include all aspects of the originally installed system as well as system training.

1.03 SUBMITTALS

Provide a submittal for approval prior to commencement of installation and training to include:

- English language description of system operation
- One-line diagrams
- Building floor plans indicating all related equipment and their termination point
- Input/output point schedules
- A copy of the database put into logical groups that represent how information will be displayed to the user
- Sample graphics pages
- Floor plans showing location of all controllers and sensors
- Co-ordination drawings showing interface terminal numbers and cross-referenced wire numbers for all connections between the SMS and other equipment
- Details of all related equipment
- Full details of each control station including equipment and wiring diagrams and terminal layouts
- Fully detailed wiring diagrams for the entire security control, monitoring and electrical cabling installation

1.03A MATERIALS

Furnish and install at locations shown, the specified equipment to provide a completely operational Security Management System. The following list of main items of the installation shall not be considered to be all-inclusive:

A. Door hardware and accessories
B. Card Readers
C. Monitors
D. PC Workstations
E. Network Interface Boards
F. Distributed Control Units
G. Security Control Units
H. Printers
I. Alarm relays
J. Miscellaneous cable, wire, associated connectors, and hardware
K. Power supplies

All materials and equipment shall be standard, regularly manufactured equipment.
All systems and components shall be thoroughly tested and proven in actual field use.
All system main control components shall be from one manufacturer.

1.04 QUALITY ASSURANCE

System manufactures shall have implemented a Quality System that complies with the **ISO9001 model**. Factory owned System Integrators shall be able to exhibit a commitment to gaining **ISO9002** accreditation or shall have an existing accreditation in place. A factory owned office that is also ISO 9001/ISO 9002 certified or an authorized distributor of the manufacturer shall install the SMS equipment. Any other installers will not be acceptable bidders for this project.

Evidence of the Quality System Audits may be requested.

1.05 WARRANTY PERIOD

A. GENERAL

Provide maintenance of the system during the warranty period with the following minimum provisions:

- Notify building owner's representative prior to performing any maintenance work.
- The designated representative to monitor and report on equipment performance and service history, and to be a liaison with the building owner.
- Conditions: The warranty shall cover any defects in materials and workmanship including installation and programming which shall be found during the warranty term.
- Response: The contractor shall respond to calls for warranty service within eight working hours. Emergency service shall be obtainable within four hours of notification by the Owner. Emergency service shall be obtainable on a 24 hours basis, seven days per week, 365 days per year.
- Qualifications: The contractor shall utilize factory-trained technicians located within 100 miles of the job site.
- During the general warranty period the installing contractor shall perform no less than (2) preventative maintenance (PM) visits no less than 6 months apart from one another. These PM visits shall provide a complete and thorough system check out. A detailed report of the PM visits shall be provided to the customer.
- Warranty period shall be (1) one year from the date of acceptance by the owner.

B. EXTENDED SERVICE AGREEMENT

Provide a SEPARATE, fixed price for comprehensive maintenance of the complete SMS system from date of completion of the Warranty Period for the required period. The owner shall have the right to accept this portion of the proposal at any time during the general warranty period. Submit price with the base bid price.

- Provide a renewable annual maintenance agreement. The agreement shall provide for quarterly inspections and maintenance of repair items. The agreement shall at a minimum provide for all of the terms and conditions of the general warranty period.
- Extended service agreement shall also include automatic software upgrades as made available by the original manufacturer of the SMS system and related components.
- Preventative or routine maintenance as required after the Warranty Period.
- All labor and materials for repair or replacement of defective equipment as required after the general warranty period.
- A designated representative to monitor and report on equipment performance and service history and to be a liaison with the building owner.
- Continuity of service personnel.

1.06 OPERATION AND MAINTENANCE DATA

A. OPERATION MANUALS

The contractor shall deliver three composite “Systems Operation and Maintenance” manuals in three-ring binder form or bound handbook form, sized to hold the material below.

Each manual shall contain, but not be limited to:

- A Statement of Guarantee including date of termination and the name and phone number of the person to be called in the event of equipment failure.
- A set of operational procedures for the overall system that includes all required customer activities that allow for customer operation of all system capabilities. This procedure shall fully address all customer- established system operating objectives.
- Individual factory-issued manuals, containing all technical information on each piece of equipment installed. In the event such manuals cannot be obtained from a manufacturer, it shall be the responsibility of the contractor to compile and include them. Advertising brochures or operational instructions shall not be used in lieu of the required technical manuals and information. All manuals shall be printed to ensure their permanence. No “blue line” type of reproduction is acceptable.
- Provide six sets of manuals to include:
  - Updated functional specification.
  - Specification sheets and technical brochures on all equipment.
  - Fault finding literature.
  - Listings and description of application programs.
  - Programmer's manual.
  - Operator's manual including schedules of alarms, parameters, status, analog indicators etc.
  - Drawings.
  - Commissioning data.

1.07 OWNERS TRAINING

The contractor shall supply personnel to train key customer personnel in the operation and maintenance of the installed system. The training program shall be designed to provide a comprehensive understanding and basic level of competence with the system. It shall be sufficiently detailed to allow customer personnel to operate the system independent of any outside assistance.

On-line context-sensitive HELP screens shall be incorporated into the system to further facilitate training and operation.

The training plan shall include detailed session outlines and related reference materials. The customer personnel shall be able to utilize these materials in the subsequent training of their co-workers.

Training time shall not be less than a total of __16__ hours, and shall consist of:

- …8…hours during normal day shift periods for system operators. Specific schedules shall be established at the convenience of the customer.
- …8…hours of system training shall be provided to customer supervisory personnel so that they are familiar with system operation.
- The specified training schedule shall be coordinated with the customer and will follow the training outline submitted by the contractor as part of the submittal process.

1.08 EXTRA MATERIALS

Based upon the contractor's and the manufacturer's experience with the equipment's performance history, the contractor shall submit a final spares list for all functions for this system. This list shall be based upon a philosophy of maintaining a central system operation with a simple remove/replace capability. The final spares list shall be developed as a result of a joint customer/contractor review of the recommended list during the installation phase. Submit this final recommended spares list for approval prior to system completion, so that spares are available upon activation.

As a minimum the base proposal shall include:

- (3) Door Control Panels
- (2) Card Readers
- (1) Fixed Cameras
- (1) System Power Supply
- (1) Communications Interface Board

Requested repairs to the system shall be completed within 48 hours.

PART 2 PRODUCTS

2.01 GENERAL

A. Acceptable manufacturers:

1. Security access system:
   A. Base: I/NET Seven as manufactured by TAC Inc.

B. Manufacturer qualification:

1. General: The product submitted for bid shall be manufactured by a firm with the following minimum qualifications:

A. The firm shall be ISO 9001 certified.
B. The firm shall manufacture all circuit boards and software.

C. Installer Qualifications

1. General:
   A. Installer must be a licensed TAC systems integrator
   B. System to be installed by Utah-Yamas Controls as an extension of the existing security system.

D. Definitions

LAN: Local area network.
UPS: Uninterruptible power supply.
SMS: Security Management System.
SCU: Security Control Unit
DIO: Discrete Input/Output Unit
READER: Selected card reader technology.

2.02 SECURITY MANAGEMENT SYSTEMS

GENERAL REQUIREMENTS

System administration shall be available from any workstation in the system. The system specifically must have the capability to support not less than 48 concurrent workstations connected on the network at the same time manipulating and modifying the same database. The Security Management System shall support distributed processing such that all connected workstations function in a true multi-user, multi-tasking environment. The system shall not be dependent on a Server therefore fully Client / Server based systems are unacceptable.

The system architecture shall be capable of supporting single sites and/or campuses as well as multiple sites located in different geographical locations. Any additional software options needed to support a multi-site or multi-campus system shall be included in the base bid. Connection to remote facilities shall be handled through a TCP/IP connection.

The Operating System shall be based upon a Microsoft Windows 2000, XP Professional, or Windows Server 2003 platform. Unacceptable operating systems include Windows 95, Windows 98, Windows ME, Windows NT4, Windows NT5, OS/2 and UNIX operating systems.

The system shall co-exist with the Microsoft Office Suite of applications.

The system shall support web based viewing and control.

The system shall employ a non-proprietary, open, highly scaleable database based on Microsoft SQL.

The system shall have the capability, as originally bid, to transmit alarm and video information to remote and wireless operator terminals. From these terminals, operators of the system shall be able to:

- Individually call up cameras from multiple locations at the same time.
- Individually call up pre-recorded video footage.
- Take control of the facilities electric locking equipment in order to perform an emergency lock down.
- See section XXXXXXXX for additional details.

It is the intend of the customer to utilize as much of the existing hardware and communications infrastructure as possible to minimize the installation costs. Any associated integration with the existing system or systems should be considered.

2.02.1 SOFTWARE

A. GENERAL

The Contractor shall provide all software required for efficient operation of all the automatic system functions required by this specification. Software shall be modular in design for flexibility in expansion or revision of the system. It is the intent of this specification to require provisions of a system that can be fully utilized by individuals with no, or limited, previous exposure to PC's and programming techniques and languages. If the system to be provided requires the use of any modified BASIC, C, PASCAL, or DRUM language program, or writing "line" programming statements to modify operation or strategy in the system, the vendor shall provide 24/7, unlimited, no charge, software modification and support for a period of five years after the completion of the project in addition to the warranty period specified elsewhere. Systems that are factory programmed are unacceptable.

The software shall include a general-purpose operating system, as well as access control system application software. All available vendor workstation application software shall be provided with the system, and shall reside in each and every PC. Unbundled software packages where the vendor can charge the user extra fees, require dedicated workstations, require annual software renewal licenses or require systems rebooting for access are unacceptable.

The software in the system shall consist of both "firmware" resident in the controllers and "software" resident in the operator workstations. The architecture of the system, and the application software/firmware shall be distributed with no single-system component responsible for a control function for the entire sub controller LAN. Each controller resident on the system shall contain the necessary firmware and I/O capability to function independently in case of a network failure. No active control sequences shall be resident in the PC workstations. All PC workstations shall be removable from the system without loss of control function -- only alarm monitoring, long-term history collection, database additions/deletions, and operator monitor/command/edit functions would be lost.

The primary operator interface to the system shall be through a graphical, “object oriented”, interactive presentation using a mouse and cursor for object selection and commands. The SMS contractor shall work with the customer to complete fully integrated graphics pages allowing operators of the system to manipulate controlled points using only a mouse. The system shall not be limited to only one type of operator interface at a time.

The system software shall support an operator definable “default” system page. The default system page shall be displayed upon system start-up, operator activity time-outs, and when the system is not in use. This default system page may be any one of the standard dynamic graphic pages or a custom display developed for this purpose. The operator shall be able to display their corporate logo, emergency information, etc. as the default system page.

The system software shall support "pop-up" windows for point commands. On selecting an object with the cursor, a window shall open up to present the operator with choices

corresponding to the operator's password authorizations. These point commands shall include state changes, manual override of application software, test mode activation and test value entry. This window shall include, for reference, the point's descriptor (name), the point's hardware address, and alarm status.

The system software shall support "pop-up" windows for point editing. On selecting an object with the cursor, a window shall open up to present the operator with a list of active point database editors, if permitted by the operator’s password level. Selecting one of these editors shall allow the operator to modify the basic parameters associated with a point, as well as access any programs assigned to the point (such as time schedules, calculations, events, etc.).

The system software shall be based upon interactive prompts and choices using "dialog boxes," as opposed to memorization of commands, "syntax", exact spellings, etc. This interactive prompt and choices approach shall be used in monitoring, issuing commands, and editing. Command choices shall be as simple as "clicking" the cursor over the correct word choice prompts (i.e., SECURE, RELEASE, UNLOCK), without typing in the letters.

The system software shall support a “zoom” function. It shall be possible for an operator to locate any system point to monitor status, issue commands, or edit associated database without knowledge of the point's name, address, or associated controller, and without having to refer to a "tree" directory. The operator shall be able to zoom in on a building in a campus graphic, zoom in on a floor in a building graphic, zoom in on a door in a floor plan graphic, etc.

The system software shall be compiled for faster execution speeds and shall offer all of the following features and capabilities:

- Input / Output Capabilities: From any local PC workstation or any remotely connected PC workstation, the system operator shall have the capabilities through the keyboard/mouse to request dynamic displays of current values or status using a tabular or graphic format. A global database sort utility shall allow an expanded tabular display of only the points on the current graphic display. This expanded tabular display shall list point name, hardware address, dynamic state or value, alarm status, override status, and test mode status.
- Obtain a summary of all access control doors with status (under access control, access control disabled, or access control ignored) and allow issuing commands to the access control doors to manually force the door to one of the above states, or provide a momentary release (act as a valid key/card access), or return to automatic control (remove manual state).
- Add, delete, or change points within each Controller or application routine while on-line.
- Change point I/O descriptors, status, and alarm descriptors and engineering unit descriptors while the system is on-line.
- Add new Controllers and sub-controllers to the system while the system is on-line.
- Develop, modify, delete or display full range of color graphic displays providing dynamic, animated displays. All development, editing and display work shall be capable of being performed with the system fully on-line and in full communications with the Controllers and sub-controllers.
- To enhance system response the database shall be distributed with up to 96,000 ID records residing in each door-processing unit. Each DCU (distributed control unit) shall support a combination of up to 64 sub LAN controllers consisting of DPU’s (Door processing unit), DIU’s (digital input units), DIO’s (digital input/output units) or MR’s (micro-control units). Each DPU and DCU shall be capable of providing full access control decision capabilities and monitoring of assigned input/output alarm points whether on or off-line with host computer.

2.02.2 DATABASE CREATION AND SUPPORT

A. GENERAL

The intent of this specification is to provide an ACS system that will allow the owner to independently perform his or her own modifications to the system from any operator workstation. All changes shall be done utilizing standard procedures, and must be capable of being done while the system is fully on-line and operational.

The DCU on the Controller LAN shall automatically check a PC workstation's database files upon connection to verify a current database match. A utility shall inform the operator if the DCU's database files do not match the backup files stored on the PC

workstation, along with the date of the last DCU modification and date of the last backup. The owner must have, as a minimum, the on-line capability to:

- Add, Delete and Modify and points and parameters.
- Determine which PC workstation(s) will receive alarms, messages & transactions on a point by point / door-by-door basis.
- Change, add, or delete English language descriptors (i.e., name). System I/O points may be identified either by name or by it's logical address. Up to 16 characters shall be available for the English language descriptor, which shall be used in all control sequences. Use of a second abbreviated point "name" for control sequences is unacceptable complexity.
- Add, modify, or delete alarm limits.
- Add, modify, or delete individual records.
- Add, modify, or delete points in start/stop programs, trend logs, etc.
- Create and/or modify override parameters.
- Add, modify, and delete any applications program.
- Create custom relationship between points. A general-purpose user utility shall be provided, such that the user can implement software interlocks, calculations, etc.
- Assign application programs to points (as opposed to assigning points to programs).
- Obtain an "audit trail" of which application programs are controlling an individual point, on a point-by-point basis.

2.02.3 DOOR PARAMETERS

Provide a door parameters editor, which shall include the following options:

- Reader technology selected.
- User definable Wiegand reader formats between 26 and 64 bit.
- If the reader is for the cab of an elevator (lift).
- If the reader is used for “exit” (pushbutton exit being the default), and if so, whether the exit reader is used for continuous egress or is linked to the Mode Schedule of an “entry” reader.
- The minimum time (in seconds) allowed between successive “reads”. Used to adjust traffic flow rates through portals such as turnstiles.
- The polarity of the reader’s LED used to indicate a good read, etc.
- Whether anti-passback (APB) is implemented or not.
- What the entry zone number is (APB).
- What the exit zone number is (APB).
- Escort required criteria.
- Anti-passback criteria
- Customizable reader buzzer control per event type.
- Whether the door sense switch is used, and if so whether it is a normally open (NO) or normally closed (NC) contact.
- Whether the Request to Exit (RTE) is used, and if so whether it is a normally open (NO) or normally closed (NC) contact.
- Whether a shunt function is used.
- Whether the door-locking device (e.g., an electric strike) is used, and if so, whether it is activated for entry requests, exit requests, or both.
- How long the locking device will be unlocked after an authorized read or RTE pushbutton operation. The unlock interval shall be adjustable from 1 to 255 seconds.
- “First Key Auto-Unlock” shall be available to provide additional security for doors that implement access control after hours and automatically unlock the doors on a time schedule during the day. This feature does not unlock the door until an authorized key is read after the scheduled unlock time. If this feature is not used, the door is unlocked per the Door Mode Schedule, regardless of key activity.
- “Door Prop” alarm timer setting. This setting shall ignore the door monitor switch input for alarming during the timer interval. The timer shall be adjustable (operator selectable) from 1 to 7200 seconds.
- Individual door configuration for 2-man rule.
- The polarity control of the reader audible device to be configured for individual sounds based upon the door event (forded door, valid card read, denied card read, door open to long).

2.02.4 SYSTEM PASSWORDS

To limit control by the system operators, the SMS shall support system passwords at both the host level and controller level.

- The host passwords shall limit user access and privileges to provide system level security. A password shall be required to “log on” to the system. The SMS host shall support up to 1,100 passwords. It shall be possible to enable or disable each and every individual function of the SMS on a password-by-password basis using a simple point and click operation. Each password shall allow a 30-character operator name, a 10-character alphanumeric password, and 4 characters for the operator

initials.
- System passwords time out after a user-defined period of time.
- The SMS System shall also be capable in utilizing the customers' pre-issued network ID and password to automatically log them into the SMS system.
- Logon passwords shall allow for any number of limited views
- Automatic expiration of passwords as set by system administrator.
- Non re-use of system passwords
- Screen settings and system configurations are remembered based on password log in.
- User configurable ID card log on in lieu of keyboard log on.
- Separate from the SMS logon an additional layer of passwords shall limit operators from gaining access to certain control panel functions. The controller passwords shall restrict user access and privileges to system controllers. The controller passwords shall support 4 levels:
  - Level 1 – Display only access
  - Level 2 – Display controller data, issue commands, acknowledge alarms.
  - Level 3 – Display data, issue commands, acknowledge alarms and edit all functions except the DCU password function.
  - Level 4 - Display data, issue commands, acknowledge alarms and edit all functions, including the DCU password function.

2.02.5 SYSTEM RESPONSE TIMES

Any state change or alarm condition shall be communicated to the SMS system immediately and without delays. The times listed below shall serve as the SMS systems maximum times for doing automatic refreshes and point polling.

- Change of State: Time for a change of state or value of a field point to register an alarm or update at the workstation: 3 seconds.
- Manual Command: Time for a manual command from the workstation to override a field device: 1 seconds.
- Graphics Display: Time to display a full graphic with current parameter values: 8 seconds.
- System Logs: Time to display a system log or report: 8 seconds.
- Global Data Transfer: Time for data to travel between standalone controllers: 3 seconds.
- Local Control Event: Time for standalone controller to initiate an output action after a change of input: 2 seconds.

2.02.6 ALARM /MESSAGES/EVENT SIGNALING AND ARCHIVING

A. ALARMS

The SMS shall provide for user definable alarm summary screens. As a minimum the SMS shall support critical alarms, priority alarms and routine alarms. The user definable alarms summary screens shall support four states as follows:
- Point in alarm (Un-Acknowledged)
- Point in alarm (Acknowledged)

- Point returned to normal (Un-Acknowledged)
- Point returned to normal (Acknowledged)

The system shall support functions such that either of the two acknowledgement functions can be disabled so that they are not required.
For a low priority informational alarm - acknowledgements would be configured as not required and the sequence in the alarm window would be such that the alarm would appear when it enters it's alarm state and automatically clear from the alarm window when it returns to normal. The operator is still given the ability to acknowledge the alarm and append text etc but this is not enforced.
For a medium priority alarm - "point in alarm acknowledgement" is required and regardless of whether the alarm returns too normal or not, the alarm will remain in the alarm window until it is acknowledged. If the acknowledgement is prior to the return to normal then the alarm stays in the alarm window until the return to normal is received at which point it automatically clears down.
If the acknowledgement is after the return to normal then the alarm clears down once the acknowledgement process is completed.
For the highest category of alarms the return to normal message also requires to be acknowledged. This alarm cannot clear down until both acknowledgements have been given.

The system shall support user selectable colors by alarm category. The status colors shall indicate the following:

- Alarm – The point is currently in alarm, and the alarm has not yet been acknowledged.
- Alarm Acknowledged – The point is currently in alarm, and has already been acknowledged.
- Return to normal – The point went into alarm, but has since returned to normal without being acknowledged.

The configurable summary screens will display the date/time that each alarm occurred, the number of times the point has go into alarm, the point address, the name assigned to the point, the current status of the point, and the system graphic page the point can be found on. The SMS shall provide a means for storing all alarms, messages, and events for an indefinite period and allow for quick retrieval at any time. The Alarms database shall be an open format. The SMS shall maintain as, a minimum, the latest 10,000 alarms for quick review or display. In the event of an alarm condition occurring, the SMS shall display a message on the operator workstation, print on the printer, sound an audible alarm, optionally display the graphic page the alarm point has been assigned, and optionally set off a visual annunciation (i.e. flashing lights).

The SMS shall have the following alarm processing features, all of which shall be user definable:

- Allow the user to add “wav” files to alarms based on alarm category
- Incorporate an icon on the banner which shows the number of unacknowledged alarms
- Print of the alarm screen currently being viewed
- Define multiple filters on any alarm window
- Sort the alarms contained in any window
- Alter the display preferences for any window
- Remember preferences and filters by user login
- Send alarms to pagers, beepers, mobile phones, PDA’s, and e-mail
- Escalate alarms to other destinations based on user definable parameters
- Provide for user selectable Image Verification based on card access control alarms.
- Each off normal condition shall cause an alarm and an appropriate message, including the time of the alarm, system and point descriptor, and alarm condition. The operator shall have the capability to select, at any time, which state/value shall be considered alarms and which alarms shall cause automatic dial-out to occur.
- Each critical alarm or change-of-state message shall be displayed. All Controller LAN network alarm messages shall be stored on disk and may be reviewed on the CRT and/or printed on operator selected printers at any time. It shall be possible to sort this alarm/change-of-state database by date, time and/or item fields.
- Provide an automatic page selection option for alarms. This feature (operator activated and selectable) automatically selects and displays the designated “best” graphic page for each alarm, even when the operator is signed off. In the event of multiple alarms, the page associated with the most recent highest priority alarm is displayed.
- Automatic user defined time delay of alarms during equipment start-up or shutdown shall be provided to prevent nuisance and false alarms.
- Unique alarm delays on analog and discrete input points to prevent "flutter" alarms.
- The operator shall have the capability to route specific alarms to specific workstations, and/or to specific pagers.
- Each operator workstation (user configurable) will have the ability to notify an operator of an alarm condition anywhere in the system. Alarm notification shall consist of:
    - Automatic print of the alarm condition.
    - Display of an icon indicating an alarm condition, including while in a third party program.
    - Operator selectable audible alarm indication. The audible alarm will be user configurable.
    - Relay operation at the PC workstation, used to activate notification devices where the operator will be too far from the PC to see visual indication, or the environment is too noisy to hear the PC's audible alarm.
    - Automatic alarm/message redirection of unattended workstations connected on a WAN.

B. EVENTS

The ACS software shall have the ability to automatically initiate commands, user-defined messages, take specific control actions, or change control strategy and application

programs as a result of an event condition.

- An event condition may be an analog high or low value crossing, an operator defined limit, a change-of-state, a specified state, or alarm occurrence, a return to normal or logical combinations of the above. Events shall not be limited to alarm occurrences only but shall also include time, dates, as specified system results. All event assignments or modifications shall be owner defined through the input keyboard.

C. MESSAGES

The system shall be capable of automatically displaying or printing a user-defined message subsequent to the occurrence of selected events. Events shall not be limited to alarm occurrences. It shall be possible for the owner to construct independent messages for each DCU, each with as many as 64 characters. The operator shall be able to:

- Compose, change, or delete any message
- Display or log any message at any time
- Assign any message to any event

The Messages database shall be an open format or provide a means to export the messages information for use in other third party programs.

D. ARCHIVING

The system shall be capable of automatically archiving. Based on user configurable options the system shall be capable of:

- Automatic or manual archiving.
- The overall size must be fully configurable up to 5 million records. 3 millions records shall be stored online with no archiving.
- Start archiving based on Time, Size, Operator or any combination.
- Decide where the archive will go.
- Archived items will be accessible directly from the access control systems alarm-handling screen.

2.02.7 TRANSACTIONS

Transactions Summary: Provide password-protected access to historical files containing Access Control related transactions. The Transactions Summaries shall be based upon user defined “filters” to the Access Control database. The filters shall operate over user defined time ranges for time and date, using a two entry (earliest, latest) selection for both time and date to support multiple days, each with a time slice, versus a continuous duration between two days. The operator shall be able to establish an unlimited quantity of custom “filters”, on-line. In addition to providing an “all transactions” filter, provide an operator definable custom filter template with the following entries:

- Filter Name
- Point Address - Doors shall be points in the system. Provide two Door Points which define the low and high end of a range of Doors
- Tenant - Provide two Tenant numbers which define the low and high end of a range of Tenants (1-255)
- Key/Card - Provide two ID numbers which define the low and high end of a range of ID numbers
- Zone - Provide anti-passback zones which define the low and high end of a range of anti-passback zones (0-64)
- Records Display type: Permanent/Temporary/Both as defined in the Individuals Editor.
- Device Name: 16-character Door or Elevator cab name. May be used as an alternative to the Point address range above, for operator convenience.
- Group Name
- Last Name
- First Name
- Field Names: Provide a separate entry for each of the 1 to 16 user-defined fields. These fields may have from 1 to 16 ASCII text characters, as well as the wild card? And * symbols for matching and sorting on subsets of a field.
- Transaction Selection: Operator shall be able to select from any or all of the following: Reader entry, Reader entry-elevator, Reader exit, Denied - schedule, Denied - APB, Denied - tenant, and denied -Issue, Denied - selection.

Provide a print utility for the transactions summary, which includes the following statistics:

- Reader entries for selected readers (excludes elevators)
- Elevator entries for selected readers
- Elevator floor selection
- Reader exits for selected readers

- Reader denials (based upon Tenant, issue, selection, schedule, or APB)

2.02.8 ACCESS CONTROL PERSONNEL DATABASE

A. GENERAL

Provide a personnel database that shall reside in the PC workstation in a SQL format, and have access control functions downloaded to the Controller and DPU for remote, standalone operation. Where the system consists of multiple PCs on a Commercial LAN, changes to the Personnel Database in one PC workstation shall be equalized among all ACS workstations, automatically. All changes shall be done utilizing standard procedures and must be capable of being done while the system is on-line and operational. The ACS system shall employ a user-friendly “re-cycle bin” feature which is intended to protect the owner from accidental or incidental deletions of the cardholder or personnel database.

The owner must have as a minimum, the on-line capability to:

- Add, delete, modify and copy new ID devices (keys, cards, templates) and link these to the Personnel Database.
- Assign information to the Personnel Database including the ID #, Last Name, First name, Group Name, and other user defined fields. The user shall be able to define the Field Name for the user-defined fields and field database entries of 16 alphanumeric characters. In a multi-tenant system, individual authorized tenants shall be able to assign different field names to their respective Personnel Databases.
- Video badging images
- Assign status to a card, which may be permanent (not a visitor), temporary (a visitor), or disabled (entered into the database, but not enabled). For cards designated as temporary, allow the operator to pre-determine the activation schedule based upon the following entries:
    - Begin date (MM/DD/YY)
    - Begin time (HH:MM)
    - End date (MM/DD/YY)
    - End time (HH:MM)

Provide a means for the user to define the content and order of data presented in the Personnel Database editor specifically, provide the ability to set the sort order on any field and filter and sort the data within any field. The following options shall be available to the operator:

- Permanent records - include/exclude
- Temporary records - include/exclude
- Disabled records - include/exclude
- Display Order - allows the operator to select from key/card #, Last name, First name, Group, or any of the user defined 16 fields as the basis for the primary ordering of the presentation display. For instance if the custom field “Social Security #” were selected, the individuals would be presented in order of the alphanumeric sort of the Social Security #.
- Key/card range - Displays only ID #’s between the low and high values entered.
- ASCII text parameters - For each of the custom fields, allows the entry of up to 16 characters for matching and sorting, including the wild card characters of? and *. * shall be the default and support all entries (a wide open filter)
- Anti-passback options whether hard, soft, or graced.

Provide a means to assign doors to designated tenants, groups, and individuals. Assign individuals to doors associated with the tenant that the individual is a part of and the group that individual is apart of.

Provide a means to assign Mode Schedules to doors, that determine when the door is under access control, when the door is unlocked, and when the door is locked (even against authorized access control devices). Also, an Anti-Passback reset trigger may be assigned to the door mode schedule to cancel and purge anti-passback “flags” set previously (i.e., the previous day).

Provide a means to assign Personnel Schedules to doors, that determine when (date and time) authorized personnel are permitted access to designated doors. Each personnel schedule shall support seven access intervals, each with a start and stop time (time slice). Provide a seven-day week plus seven “special” days and two temporary days for each personnel schedule. Provide the ability to assign up to 31 personnel schedules per door.

Provide a means to assign personnel to "Groups" which consist of a combination of doors and associated personnel schedules. The system shall also be capable of issuing multiple groups to an individual cardholder. The user shall be able to assign individuals to groups to save keystrokes and manages organizational changes. Different tenants shall be able to assign different groups to their respective access control databases.

2.02.9 REPORTS

A comprehensive report writer capability based on Crystal Reports from Seagate shall be provided in each workstation. The report writer shall have design capability built in as well as provide report templates and report wizards. The report writer shall have the capability to sort and extract data from the on line open database as well as from archived files and be able to generate finished custom reports. Reports shall be capable of manual initiation and/or printout as well as automatic printout. The system will have the capability to print reports on a daily, weekly, monthly, yearly, or automatically generate reports based upon a set scheduled. The system will have the capability to print reports as a result of an "event". This report writer shall provide the capability for statistical data manipulation and extraction. As a minimum, the custom report writer must provide the capability to generate four types of reports: statistical detail reports, summary reports, trend graphic plots for up to four variables, and x-y graphic plots.

Prepared Historical Report: Provide an on-line, historical, database sort report utility, with the following features:

- Prompts to select database sort by time, by date, by point (or range of points) with system supplied default values of 24 hours, today, all Controller LAN points, respectively.
- Prompts for activating conditional sorts, including: changes-of-state, alarms, returns to normal, operator sign on/off, operator acknowledgments, command errors, program control of a point, test on/off, manual on/off, program control (AIC, Event) override, power restore, LAN reconfiguration, controller off-line, time/date modifications, and archive disk memory 90% full, 95% full, and full.
- Provide audit trail messages of operator edits of access control, specifically editing the databases for individuals, groups, tenants, transactions, doors, personnel schedules, access-initiated control, and elevator control. Also, include door prop alarms, forced door alarms, and failure of the database to download to field controllers.
- Single keystroke retrieval resulting in a report listing the most recent condition first, along with the time, date, address, name, condition type, and value.

The System shall provide the operator with a set of "canned" reports. The "canned" reports shall include but not be limited to the following:

- Alarms Door-Individual Field Roster
- AMT Archive Performance Report
- Analog Sample Report
- Archives Analog Sample Report
- Archive Consumption Sample Report
- Archive Demand Sample Report
- Archive Discrete Sample Report
- Archive Override Billing Sample Report
- Archive Runtime Sample Report
- Audit Trail Report
- Door-Group Roster Report
- Door-Individual Roster Report
- Door-Tenant Roster
- Group-Door Roster Report

- Group-Individual Field Roster
- Group-Individual Roster
- Messages Report
- Network Configuration
- Tenant-Door Roster
- Tenant-Group Roster
- Tenant-Individual Field Roster
- Tenant-Individual Roster
- Transactions - Doors Report
- Transactions - Individuals Report
- Zone Census Report

Free Form Historical Reports: An operator shall be able to manually request reports from a console keyboard. All reports shall have time and date and shall not be limited to "canned" or "standard" format. Data shall be gathered from the field LAN's automatically, and archived on owner-selected workstations. The systems shall include a report writer function that supports as a minimum, the following functions:

- Long term data archiving to hard disk
- Automatic directives to download to transportable media such as floppy diskettes or tapes for storage
- Data selection methods to include database searches, sorts, and manipulation
- Data extraction shall support mathematical manipulation
- Data reports shall allow development of XY curve plotting, tabular reports (both statistical and summary), and multi-point timed based plots with not less than four (4) variables displayed.
- Generating reports either normally at operator direction, or automatically under PC directions. Both Events driven and scheduled automatic reports shall be supported.

Archiving to disk shall automatically occur as long as the PC workstation is ON and physically capable of communicating with the Controller LAN(s), regardless of what programs are currently being executed at the time data is needed to be stored to disk (i.e., an operator can be developing a financial spread sheet in Microsoft Excel when the ACS stores field trending information to disk -- the current Excel program shall not be interrupted or halted) for archiving.

Proprietary reporting packages will not be acceptable.

Provide facility to extract data from archived files and generate custom reports.
Automatically generate reports through user or fixed time schedules, or on demand.
Provide facility to generate reports in a user-defined format.
Provide facility to export (as a whole or individually) the following data to be used in some other common database software package:

- Tenants
- Floors
- Doors
- Transactions
- Messages
- Passwords
- Individuals
- Groups
- Field Names
- Alarms (sorted by priority)

Support two printer operations. The alarm printer will print all alarm annunciations and return to normal, operator acknowledgments, action messages, system alarms, operator sign-on and sign-off. All operator control activities shall include the operator's initials in the printed and disk record.
The data printer will be reserved for printing reports, graphical page prints, and database prints. Both printer functions shall be available from any PC workstation.

2.02.10 HELP SCREENS

Context Sensitive Help Screens: Provide context sensitive help screen associated with the current keyboard/mouse input.

Application Sensitive Help Screens: Provide the capability to develop help screens tailored to job specific applications. These screens shall be displayed by selecting an icon from an associated graphic display. These help screens will be intuitive in nature and provide the operator the ability to perform the task at hand without any help from outside individuals. The help screens will automatically prompt the operator to enter relevant information in to specific areas of the system.

In addition to the help screens, the SMS system will provide the operators of the system with administrative Wizards designed to aid in the training of operational personnel. These Wizards will also set operators through the process of modifying the cardholder database. As operators are editing the cardholder database through the Wizards, the information shall also automatically be added to the system with no additional editors being opened.

2.03 OPERATOR WORKSTATIONS

GENERAL

If required, provide an on-site operator workstation to provide user friendly, operator interface with the complete system.

If required, provide an off-site operator workstation to provide user friendly, operator interface with the complete system. Provide all operator interface software and commissioning.

A. HARDWARE SPECIFICATIONS

Provide workstation equipment, conforming to the specified requirements. (Refer to the project requirements schedule).

Pentium IIII – 1.2GHZ
512 MB Ram - File Master
256 MB Ram - workstation (equalization station)
40 gig. Hard Drive
3.5 Floppy Drive
CD – RW Drive for data archiving
17” Video Monitor w/display 800 X 600
Appropriate Windows Operating System with SQL
Sound card/speakers for audible alarms

2.03.1 SOFTWARE GENERALLY

The SMS shall allow all connected workstations to function in a true multi-user, multi-tasking environment such that:

- All terminals can access the same network and database at the same time.
- All terminals can access and/or control the same control unit at the same time
- All terminals can access and/or modify the same control unit database at the same time
- All terminals shall be able to archive data, alarms, access transactions, and network actions to hard disk regardless of what application programs are being currently executed (i.e., LAN operating system, spreadsheets, word processing, etc.). All archiving disk traffic shall be accomplished on-line without affecting the operation of the current programs.
- An operating system to control all support functions including memory allocation, disk access and external devices.
- An application package specific to the manufacturer's SMS, operating in a Microsoft Windows 2000, Server 2003, or XP Professional environment.
- Any other required proprietary programs for functions such as graphics, reports etc.
- Latest revisions of all programs at time of practical completion.
- Licensing of software at time of practical completion.
- The software shall include all available software licenses for a fully integrated Security/Access Control and Lighting Control system.

Operator Workstation: Any operator workstation shall:

- Accept data from the Controller LAN on an as needed basis without having to scan the entire network of DCU's or MCU's for updated point data.
- Interrogate the Controller LAN for updated point data when requested by the system

operator.

- Allow operator command of equipment connected to DCU's and MCs.
- Allow operator to place specific DCU's and MCU’s in or out of service.
- Allow parameter editing of DCU's, MCU’s, and "gateway" nodes (limited only by an individual operator's password assignments).
- Store duplicate database on file for every DCU and MCU and allow this database to be downloaded to the remote panel while the system is on-line.
- Control or modify specific programs on a DCU, or MCU basis.
- Develop, store and modify dynamic color graphics utilizing system supplied mouse and mouse- supported software. It shall be possible for both mouse-supported workstations and non-mouse supported workstations to coexist on the same Controller LAN.
- Provide data archiving of assigned points throughout the system and to support overlaid graphing of this data utilizing up to four variables.
- To maintain system integrity, the operator shall have available an automatic DCU save utility. The database of the DCU’s shall be automatically uploaded to a workstation at 02:00 AM, for backup purposes. This utility will function for both direct connect and dial-up workstations.

- The operator will have the option of selecting daily, weekly or monthly as a scheduled frequency to synchronize time and date in DCU's from the PC workstation. This function will be performed for dial- up as well as direct connected locations. This program shall accommodate automatic daylight savings time adjustments.
- The ACS shall support not less than 48 operator workstations, each with simultaneous access to the Local Area Network. Regardless of how the operator workstations are connected to the Controller LAN (i.e., hardwired or via modem), the network shall support all specified functions.
- The operator may print a selected DCU database whenever desired. The operator shall be able to select any or all control parameters as needed. A "bind able" printout of the database of each DCU (including MCU's and DPU's), with a floppy disk backup shall be submitted with "as-builts" as part of the final acceptance procedure.
- The CRT shall have a feature to indicate audibly and visually, Off-Normal conditions and messages pending, whether in ACS operating mode or third party software mode.

2.03.2 GRAPHICS

The system shall support an operator definable "default" system page. The default system page shall be displayed upon system start-up, operator activity time-outs, and when the system is not in use. This default system page may be any one of the standard dynamic graphic pages, or may be a custom display developed for this purpose. Tiered graphics pages will be usable through the system allowing the operator the ability to penetrate further into the system to gain more detail on any given graphical point. The operator shall be able to display their corporate logo, emergency information, an index of all graphic pages, etc. as the default system page.

The graphics system employed by the SMS system will allow for the addition of "single button control" points to be located on any/all system graphics pages. These "single button control" points will perform a customer defined sequence of events such as:

- Automatically run and print reports.
- Secure all pre-defined doors.
- Unlock all pre-defined doors.
- Control 3rd party devices such as DVR's.
- Launch 3rd party applications
- Turn point's on/off.
- Launch 3rd party applications such as:
    1. Windows Media Player.
    2. AutoCAD.
    3. Microsoft Word/Excel.
    4. Any Windows compatible application

DYNAMIC GRAPHIC PROGRAMMING

Shall be part of the SMS system and not considered as an add-on feature. The maximum number of graphics pages supported by the system will be +10,000.

The operator shall have the ability to create, construct, and modify existing "dynamic" graphics pages for monitoring and system control without the need of outside

assistance. This graphics utility shall be usable both for on-line control such as override and alarm acknowledgment, and for display of system status and alarm activity.

The graphics program shall have the following features:

- Microsoft Windows-based “Integrated” graphic package. A separate or optional graphics generation program or package is unacceptable.
- Minimum of one second updating of real time data.
- Page summary feature for all graphic pages.
- Operator modification of set points and adjustable parameters.
- User-friendly operator development of graphics.
- Comprehensive library of symbols.
- Ability to create user defined symbols.
- Provide an automatic page selection option for alarms. This feature (operator activated) automatically selects and displays designated “best” graphic page for each alarm, even when the operator is signed off. In the event of multiple alarms, the page associated with the most recent highest priority alarm is displayed.
- On-line graphic development shall be supported on all workstations connected to the LAN either as "hard-wired" direct connect or via remote dial-in.
- Provide for import of .BMP file format graphics developed in third party programs such as Paintbrush. Such imported graphics shall be used as a "backdrop", so that all other dynamic and animated system features may be superimposed on this graphic. Similarly, it shall be possible to import CAD type drawings, by first converting the CAD drawing from .DXF format to .BMP format.
- Add, delete, develop and/or modify custom dynamic color graphic displays utilizing either custom symbols or system-supported library of symbols. Graphics shall support at least 16 colors and not less than 60 outputs of real time, live dynamic data per graphic. The system shall allow this dynamic graphic data to be displayed as an animated symbol (i.e., when a door opens the door on a floor plan moves to the open position), an ASCII set (i.e., on-off), or as an analog bar graph. Each operator workstation shall support not less than 10,000 separate graphic pages.
- The contractor shall include 15 developed graphics as approved by the owner's representative for this project. The following graphic pages shall be provided As a minimum:
  - Index page of all graphics, with direct selection.
  - Floor plan of each floor with door status with point control.

System graphics: Provide the following graphic displays:

- Master graphic from which other graphics may be selected.
- Building elevations and plans: A number of graphics indicating position of security operations centers, plant rooms and major items of equipment and providing access to other graphics.
- A series of graphics (e.g. building sections) showing all equipment operational during fire mode.
- A series of floor plans showing all secured portals and sensor locations.
- System configuration: Indicating relationship of workstation, controllers, printers etc.
- Building single line electrical diagram: Graphic showing status and values of all monitored electrical equipment.
- Include graphics for the required spare points.
- Tenancy fit out: Allow for graphics associated with tenancy fit out.

During and/or after completing construction of the dynamic graphic flow chart, the cursor may be placed on the icon, and by "clicking" the mouse; the icon may be expanded into the associated database editor for adding, deleting, or modifying the point, module, or application program. Similarly, the point may have its "pop-up" window called up to issue point commands, or overrides. Systems requiring graphic programming languages which are off-line, or require time delays for compiling, or which are not integrated into the primary operator workstation are not acceptable.

Select a graphic screen refresh rate between one-second refresh and 60 second refresh rate.

Graphic Display: On-line graphic development shall be supported on all workstations connected to the LAN either as "hard-wired" direct connect or via remote dial-in. The system shall support any mix of mouse-supported workstations or non-mouse workstations.

The systems graphic software shall provide the following minimum features:

- "Page Linking" such that it is possible to "zoom" into a specific door or any other page through a sequence of graphics without using anything but the system mouse.
- Generate, store, and retrieve library symbols for use in generating graphic pages.
- Single or double height characters.
- 60+ dynamic points of data per graphic page.
- “Hot Buttons” that are customer programmed to perform any number of sequences.
- Pixel level resolution. Graphics will be displayed on VGA monitors with a 640 X 480 resolution, minimum.
- Animated objects for discrete points (i.e., doors open and close on authorized access or when a parking gate opens it goes up on the screen).
- CCTV icons providing direct links to the device for full control.
- Analog bar graphs for analog points. The operator shall be able to locate up to 60 bar graphs per graphic page, with options as to bar graph color, dimensions, horizontal/vertical orientation, and limit values.

2.10 SYSTEM CONTROLLERS

A. GENERAL

All points in the system shall be monitored and/or controlled through "intelligent" Distributed Control Units. Each control unit in the system shall contain its own microprocessor and memory with a minimum 300 hours battery backup. Each control unit shall be a completely independent stand-alone "master" with its own hardware clock calendar and all firmware and software to maintain complete control on an independent basis. Control Units generally shall:

- Acquire, process, and transfer information to the PC operator workstations or other control units on the network.
- Accept, process, and execute commands from the other control units or other input devices, or multiple PC workstations.
- Allow access to both database and control functions by multiple workstations at the same time.
- Record, evaluate, and report the changes of state and/or value that occur among points associated with the control unit. If any operator workstation or transmission network fails, but the power to the control unit does not, the control unit shall continue to perform all control functions associated with the points connected to that control unit.
- Control Unit Upload/Download Capability: Each control unit shall be able to download from or upload to any PC operator's workstation. All point data shall be modifiable from any authorized PC operator's workstation and downloaded to the control unit over the Control Unit LAN. This upload/download shall be readily performed on a regular basis without interrupting the control functions in the control

unit. All upload/downloads shall be performed without the operator workstation being taken "off-line. Additionally, all Control Unit upgrading shall be performed via a download from any workstation on the system; i.e. it shall not be necessary to replace e-proms to perform a system revision upgrade.

- The system controllers must provide an integral time clock and have the capability to synchronize time with operator workstation.
- The system controllers must provide a dedicated port for communication link between panels as well as a redundant communications port for backup communications and have the ability to auto-detect breaks in the network.
- The system controllers must provide a separate RS232 communications port for connection of portable operator's terminal (laptop PC and/or a hand held controlling device).
- Provide sufficient input/output modules to achieve the required control functions, including the required spare points.
- Modules: Removable without having to disconnect field cabling.
- Control Unit Point Scanning: It shall be possible to independently set the scan or execution speed for each point in the control unit to an operator selected time from 1 to 254 seconds.
- Field door controllers will have the ability to store within their own memory the last card transaction.

2.1.1 CONTROLLER SOFTWARE/FIRMWARE
Provide the following features:

- Real time, day of the week and calendar.
- Automatic clock synchronization from operator workstation.
- Time schedules.
- Holiday schedules.
- Temporary schedule overrides
- Automatic Daylight Savings Time Switcher
- Software timers with one-second resolution.
- User-defined alphanumeric software and hardware point descriptors.
- Resident diagnostics, which continuously monitor the operation of the unit, enunciate faults (including continuous looping of control loops, unreliable data) and provide continuous operation using the last reliable data.
- Test mode to drive a selected point (not the physical service) to a selected value and observe the consequential effect.
- Password protection.
- Alarm processing program including the ability to redirect alarms according to alarm priority and time schedules.
- Flash downloadable.
- Individually addressed
- Spare points: Allow for all software associated with the required spare points.

Program loading: On-line, either from a personal computer directly into the Control panel or through the operator workstation network.

2.1.2 CONTROLLER APPLICATION ROUTINES

Automatic Time Scheduling (ATS):
Each Control Unit shall provide self-contained ATS programs for automatic start/stop/scheduling of devices. Each ATS program shall support up to seven normal day schedules, seven "special day" schedules and two temporary day schedules. The special days schedule shall support up to 30 unique date/duration combinations. Each load shall support an individual time program, as a minimum.

Each load shall be able to be assigned at least 17 control actions per day with one-minute resolution. Operator selectable time schedule operation choices shall include the following: Start, Optimized Start, Stop, Optimized Stop, Cycle, and Optimized Cycle.

A minimum of 30 holiday periods up to 99 days in length may be specified for the year.

It shall be possible to create "temporary" schedules up to a week in advance that will be in operation only on the day or days specified.

Support a temporary "special day" date and duration to be broadcast to selected or all sites to account for unusual situations Such as temporary operating hours or "snow days".

Support control actions to be performed at any operator selectable time of day as well as

at "sunrise" and "sunset". Sunrise and sunset parameters shall be selectable based upon time zone, latitude, and longitude.

In additional to individual load scheduling, provide for group scheduling by designating equipment to be linked to a “master” time schedule, for quick schedule changes of large groups of equipment which follow a common schedule. The master schedule shall provide a choice of fixed start and stop times by day, or a plus and minus adjustments to the existing schedule, in minutes. Master schedules shall provide a choice of immediate activation or activation at a later date and time.

Event Initiated Programming (EIP):
Each Control Unit shall provide event-initiated programs. An event may be initiated by any data point. Triggering an EIP shall cause a series of control actions in a sequence, i.e., if point A reaches an alarm condition, start points 1 through 12. Up to 64 sequences can be defined per Control Unit. Each sequence may cause up to 16 control actions. Sequences may be chained together.

Access Initiated Control (AIC)
An AIC is an automatically generated control action initiated in response to an access transaction for a selected tenant, group, or individual.

As a minimum, each Control Unit shall supply support for up to 64 AIC's regardless of the number of tenants assigned. If an AIC is directed to a single output the capability to initiate additional actions through Event Sequences and Event Action editors must exist. The capability must exist to cause control actions on a system wide basis from a single AIC (i.e. turn on Air Conditioning, lights etc.). The capability must exist to assign a minimum of 24,000 users to a single AIC. As a minimum, the following access transactions shall be capable of generating an AIC:

- Reader entry
- Reader entry - elevator
- Reader exit
- Denied entry - schedule
- Denied exit - schedule
- Denied exit - schedule
- Denied entry - PIN
- Denied exit - PIN
- Denied entry - anti-passback
- Denied entry - issue #
- Denied exit - issue #
- Denied entry - selection
- Denied exit - selection

2.1.3 POINT TYPES
The Security Management System must support small point controllers that have the capability to provide and support (if required) the following point types:

UNIVERSAL INPUTS:
The SMS system must support a voltage, current, temperature, pulse or digital input from a field device.

- Derive from voltage free contacts on the monitored equipment.
- Digital inputs:
- For push button inputs, provide means of holding signal to suit SMS scan time.
- Pulsed inputs: Provide accumulation interface, capable of accepting 10 pulses/second.

ANALOG INPUTS:

- Provide surge protection.
- 4-20 MA, 0-10 volt or 0-5 volt input.

- Accuracy: Minimum ± 0.2%.
- Minimum eight-bit analog to digital conversion.

DIGITAL OUTPUTS:

- Digital outputs with voltage free contacts.
- Indication lights for outputs.
- Adjustable pulse length for pulsed outputs.

ANALOG OUTPUTS:

- Provide surge protection
- 0-10 Volt output or 4-20 ma.
- Accuracy: Minimum ± 0.2%.
- Minimum eight-bit digital to analog conversion.
- Pulse width modulated outputs: Provide electronic interface card to derive proportional output.

Spare points: Provide the required spare inputs and outputs.

Provide digital input devices to satisfy the requirements of the installation.

2.2.0 HARDWARE SPECIFICATIONS - 7920 DOOR CONTROLLERS or SCU1284

The quantities and types of door controllers shall be determined by the contractor based upon the requirement to provide a fully operational system, as per the intent of the specification, as shown on the drawings and recommended by the manufacturer. As a minimum, the following features shall be supported in each Door Processing Unit:

96,000 resident card holders
Support for 255 tenants
Support for 4 doors per SCU
Standalone Access Control Logic
Real Time Clock/Calendar
Resident Day & Date Based Logic
Central Control and Monitoring
First Entry Auto Unlock
Zoned Anti-Passback (Local DPU level & Global across LAN)
Elevators: one or two cabs, each with one reader.
2-Man Rule
Multi-drop RS485 communications
Fiber optic compatible
On-board battery charger
Optical tamper switches
Dip switch addressable (0-31)
Supervised inputs
Flash downloadable
Supported readers technologies:

- I/DISC Touch Memory
- Magnetic Key & Card
- ABA (Track 2)
- Wiegand (26 & 32 bit)
- Proximity
- Watermark Magnetics
- Biometrics

2.2.1 CONTROLLER OPERATION

Distributed Access Control downloads all “local” access control parameters from the Host PC to the Door Processing Interface (DPI) and then to the Door Processing Unit, so that it may operate in a standalone basis. This ensures rapid access processing and

minimal dependence on a single point of failure. As a standalone controller, the DPU provides access to one or two doors. Support for a door monitor input, locking mechanism output, secondary alarm bypass output, and a request to exit input are provided for each door. Optionally, the second reader may be used for door exiting. When the door is controlled by two readers, anti-passback operation is available. As a distributed network controller the DPU allows centralized alarm monitoring, historical data collection, zoned anti-passback,
First Entry Auto Unlock allows the door to automatically unlock during the day based upon a time and day schedule (Modes) in the DPU. However, this feature ensures that the door is not unlocked until at least one “authorized” person has arrived, following occupancy time.

2.2.2 DATA COMMUNICATIONS
NETWORK: RS-485
DATA RATE: 9600 BPS
CABLE SUPPORTED: 22 AWG twisted pair, shielded (low capacitance, eg. Belden 9184 or 9855)
CABLE LENGTH: 5000 ft (1500 m) maximum
LED's are provided to indicate data transmission, receiving data,
Normal power mode, standby power operation, RAM error,

2.2.3 ENVIRONMENTAL SPECIFICATIONS
OPERATING TEMPERATURE: 32° to 122°F (0°C to 50°C) without battery backup; 50° to 100°F (10° to 38°C) with lead-acid battery backup
OPERATING HUMIDITY: 10% to 80% RH, non condensing

2.3.0 HARDWARE SPECIFICATIONS - 7930 DIGITAL INPUT CONTROLLER or SCU 1200
The quantities and types of controllers shall be determined by the contractor based upon the requirement to provide a fully operational system, as per the intent of the specification, as shown on the drawings and recommended by the manufacturer. As a minimum, the following features shall be supported in each Digital Input Unit:

RS-485 Communications – Multi-Drop
Remote Operation Over Dial-Up Phone Lines
“Point” based
Central Control and Monitoring
16 Supervised Alarm Inputs – Standard
4 States of Fault Supervision
- Cut
- Short
- Open
- Closed

Alarm Input Shunting Support
- Via DPI or MCI
- Centralized – Manual Overrides

Fiber Optic Compatible
On-Board Battery Charger
Tamper Input

2.3.1 CONTROLLER OPERATION
Control Units provide supervised alarm monitoring functions from a single microprocessor-based controller The DIU-7930 resides on a network of other DIU’s, Door Processing Units (DPU's), or Digital Input/Output Units (DIO's), all connected to a Door Processing Interface (DPI) or a Microcontroller Interface (MCI).

2.3.2 DATA COMMUNICATIONS
NETWORK: RS-485
DATA RATE: 9600 BPS
NETWORK WIRING REQUIREMENTS:
CABLE SUPPORTED: 18 – 22 AWG twisted pair, shielded (low capacitance, eg: Belden 8760) CABLE LENGTH: 5000 ft (1200 m) maximum
LED's are provided to indicate data transmission, receiving data, normal power mode.
TERMINAL BLOCKS: Removable screw terminal connectors

2.3.3 ELECTRICAL SPECIFICATIONS
CONTROLLER: 24V (±10%) DC or AC (50/60Hz), 1.2 Amps maximum
BATTERY CHARGE CURRENT: 2 Amps maximum (short circuit), 0.6 Amps typical
POWER SUPPLY: 115Vac or 250Vac transformer (50/60 Hz ±15%), 40VA, maximum
POWER FAILURE NOTIFICATION: Standard, using internal detection logic

2.3.4 ENVIRONMENTAL SPECIFICATIONS
OPERATING TEMPERATURE: 32° to 122°F (0° to 50°C) without battery backup; 50° to 100°F (10° to 38°C) with lead-acid battery backup
OPERATING HUMIDITY: 0% to 80% RH, noncondensing

2.4.0 HARDWARE SPECIFICATIONS - 7940 DIGITAL INPUT/OUTPUT CONTROLLER or SCU 1280

The quantities and types of controllers shall be determined by the contractor based upon the requirement to provide a fully operational system, as per the intent of the specification, as shown on the drawings and recommended by the manufacturer. As a minimum, the following features shall be supported in each Digital Input/Output Unit:

RS-485 Communications – Multi-Drop
Remote Operation Over Dial-Up Phone Lines
“Point” Based
Central Control and Monitoring
12 Supervised Alarm Inputs – Standard
4 States of Fault Supervision

- Cut
- Short
- Open
- Closed

8 Multi-Mode Form “C” Outputs

- Pulsed
- Tracking
- Latched

Alarm Input Shunting Support – VIA DPI or MCI

- Centralized – Manual Overrides

Fiber Optic Compatible
On-Board battery charger
Tamper input

2.4.1 CONTROLLER OPERATION

Control Units provide supervised alarm monitoring and command output functions from a single microprocessor-based controllerThe DIU-7940 resides on a network of other DIU's, Door Processing Units (DPU's), or Digital Input/Output Units (DIO's), all connected to a Door Processing Interface (DPI) or a Microcontroller Interface (MCI).

2.4.2 DATA COMMUNICATIONS

NETWORK: RS-485
DATA RATE: 9600 BPS
NETWORK WIRING REQUIREMENTS:
CABLE SUPPORTED: 18 – 22 AWG twisted pair, shielded (low capacitance, eg: Belden 8760) CABLE LENGTH: 5000 ft (1200 m) maximum
LED's are provided to indicate data transmission, receiving data, normal power mode.
TERMINAL BLOCKS: Removable screw terminal connectors

2.4.3 ENVIRONMENTAL SPECIFICATIONS

OPERATING TEMPERATURE: 32° to 122°F (0° to 50°C) without battery backup; 50° to 100°F (10° to 38°C) with lead-acid battery backup
OPERATING HUMIDITY: 0% to 80% RH, noncondensing

2.5.0 HARDWARE SPECIFICATIONS - 7793 MICRO CONTROLLER INTERFACE

The quantities and types of controllers shall be determined by the contractor based upon

the requirement to provide a fully operational system, as per the intent of the specification, as shown on the drawings and recommended by the manufacturer. As a minimum, the following features shall be supported in each MCI Controller:

Integration:
- Environmental/Energy Management
- Access Control
- General Purpose

MicroControl Units Supported:
- Universal Series Micro Regulators
- 7910A/1284 Series Door Processing Units (DPU)
- 7920/1284 Series Door Processing Units DPU)
- 7930/1200 Series Digital Input Unit (DIU)
- 7940/1280 Series Digital Input Output Unit (DIO)

Peer-to-peer Token Passing LAN Standard
Dual Microcontroller Sub-LANs
- 64 DPU's per MCI
- 64 MR's per MCI
- 64 Micro Control Units per MCI (DPU and MR combined)

Mix and Match Controllers on the subman's
Counter-Scanning Loop Option
Front End Controller for Standalone System
Supports Up to 64 Doors
Supports Up to 64 HVAC equipment units
Remote Operation Over Dial-Up Phone Lines
Fiber optic compatible
Local ports for PC or modem
Auto Dial/Auto Answer Modem Option Board
Modular, Object Oriented Programming
Gateway for Global Control Functions
Resident Programs for:
- Access Initiated Control
- Elevator Control
- Environmental Control
- Energy Management
- Historical Data Collection

2.5.1 CONTROLLER OPERATION

7793 Microcontroller Interface provides a connection between TAC's token passing, peer-to-peer Controller LAN and a network of standalone Microcontrollers. The MCI also functions as a network controller for a standalone system. The 7793 MCI serves a dual role. It can be a standalone network controller for a system of Micro Control Units. Or, it can function as a gateway between a network of Micro Control Units and other controllers in a larger I/NET 7700' Distributed Control System. An RS-232 port is standard for either a local PC or a modem. An option board adds a second port so that a local PC and an Auto Dial/Auto Answer modem may operate concurrently. Both the PC and the AD/AA modem have access to any point on the Controller LAN or the sub-networks of Micro Control Units. The MCI sup-ports up to eight telephone numbers for use with the AD/AA modem function. The MCI provides global functions for the Micro Control Units. These global functions include: Access Initiated Control, Elevator Control,

Event Initiated Control, Trending, Runtime Accumulation, Automatic Time Scheduling, Calculations, Anti-Passback and periodic synchronization of the local clocks in the Micro Control Units.

2.5.2 DATA COMMUNICATIONS

CONTROLLER LAN: RS-485; 19,200 or 9,600 baud, SDLC, token-passing
DOOR CONTROLLER LAN: RS-485; 9,600 baud, asynchronous, polling.
HAND HELD CONSOLE PORT: RJ11 Modular, 1,200 baud, TTL
RS-232 PORT: PC @ 9,600 baud (7801 TAP function), or Hayes direct-dial asynchronous modem @ 1,200, 2,400, or 9,600 baud
RS-232 EXPANSION BOARD PORT: Supports synchronous modem, direct or two-way dial SDLC (78061 or 78035 TAP functions) @ baud rates of 1,200 to 9,600 baud. Requires optional plug on module.
NETWORK WIRING REQUIREMENTS:

- CONTROLLER LAN LENGTH: 5000 ft. (1500 m) per segment. 25,000 ft (7600 m) with repeaters
- MICROCONTROLLER SUB-LAN LENGTH: 5000 ft. (1500 m)
- CABLE SUPPORTED: twisted pair, shielded. 22 AWG (0.324 mm2) or larger, 30 pF/ft. or less between conductors, 55 pF/ft. or less conductor to shield, 85 to 150 ohm impedance

AUTO DIAL SUPPORT

- TELEPHONE NUMBERS: 8, stored in NOVRAM
- NUMBER OF DIGITS: 31 per phone number
- SUPPORTED: Phone, Beeper, Pager

2.5.3 ENVIRONMENTAL SPECIFICATIONS

OPERATING TEMPERATURE: 32° to 122°F (0°C to 50°C)
OPERATING HUMIDITY: 10 – 90% RH, non-condensing

2.6.0 HARDWARE SPECIFICATIONS NETPLUS ROUTER (NPR)

The quantities and types of controllers shall be determined by the contractor based upon the requirement to provide a fully operational system, as per the intent of the specification, as shown on the drawings and recommended by the manufacturer. As a minimum, the following features shall be supported in each NETPlus Router:

- Provides a modular solution for access through standard commercial LAN/WAN systems.
- Standard TCP/IP communication protocol allowing easy integration of communication into LAN, WAN, Internet, or intranet systems.
- Support for larger number of links (sites) available — up to 6,400.
- Expanded LINK support allows distribution of commercial LAN down to the single-controller environment.
- LAN/WAN point globalization distribution to selected nodes, with user-manageable limits on distribution to minimize traffic.
- Message/alarm/globalization buffering to provide local storage of data until distribution (operates without floppy or hard disk).
- On-board battery protects buffered data in case of power outages.
- Integral and simplified installation, configuration, and checkout tools.
- Diagnostic function to verify operations.
- Optional bracket for mounting on a wall or other vertical surface.
- Ports include:
  10BASE-T Ethernet port (RJ45).
  Local PC port for I/NET host workstation or portable maintenance PC.
  RS485 synchronous SDLC controller LAN port.

2.8.1 CONTROLLER OPERATION

The NetPlus Router acts partly as a computer and partly as a 7801 or 7802 series taps. Having computer- like processing functionality, the NetPlus Router connects directly to the TCP/IP Ethernet network. Unlike a computer, the NetPlus Router does not require the space a PC does. It does not need a keyboard, a mouse or a monitor, and with its additional Tap capabilities, the NetPlus Router performs multiple functions in one compact, lightweight reliable unit.

Initially, an I/NET host PC must be connected to configure a NetPlus Router. The following configuration parameters can be viewed, edited, copied or modified for Alarm/Message/DocuTrend Routing Map, Point Globalization Map, Host/Link/IP Address Map and Host Interaction Map.

The NetPlus Router database can be uploaded, downloaded and “selectively” copied. Active and passive diagnostics are supported with the NetPlus Router. Firmware and configuration can be downloaded from PC port or LAN/WAN.

2.8.2 ENVIRONMENTAL SPECIFICATIONS

Temperature	32–122° F (0–50° C)
Humidity	5–95%, non-condensing

2.9.0 PROXIMITY READERS

The reader shall be proximity type with Smart Card chips. It shall read the ID number of the card or tag when presented to the surface of the reader without physical contact. Read range shall be nominally 4 inches from the rear surface when used with a card. Maximum dimensions shall be 4.6 inches (11.7 cm) high x 5.5 inches (14 cm) wide x 1.4 inches (3.5 cm) thick. The reader may be mounted directly on any material including metal without the use of standoffs, or concealed behind any building material except metal.

An LED on the front surface of the reader shall indicate to the user that the card or tag presented to the reader has been read. An audio beep tone to indicate that the card has been read shall be available as an option.

Electrical connections from the reader assembly to the system interface or CPU shall be via color-coded, five conductor, #18 AWG shielded cable (six conductor optional audio tone). No special connectors or coaxial cable shall be required.
Wiring from the reader assembly to the system interface or CPU may be run inside metal conduit or EMT, as may be required by electrical codes.
Any of the readers shall be capable of being powered by a 1.2 amp-hour battery for at least five hours.
Accidental or intentional transmission of radio frequency signals into the reader shall not compromise the system.
The reader shall function in the access control system's normal or anti-passback mode without changes to the reader.
The reader shall contain no internal code matching or memory devices to operate with a group of ID numbers.

The access control system readers shall have the capability to accept codes from any of the following proximity devices:

- A molded plastic credit card size maximum dimensions of 3.41 inches x 2.14 inches x .11 inches (8.7 cm x 5.4 cm x .28 cm), having a maximum weight of .48 ounces (13.5g), and a punched slot for a strap or clip.
- A "key ring tag" having maximum dimensions of 2.2 inches x 1.3 inches x .25 inches (5.6 cm x 3.3 cm x .6 cm) and a maximum weight of .36 ounces (9.9g), and having an eyelet for attachment to a key ring.
- The presence of small metal objects such as keys or coins near the card or tag shall not alter the code read by the reader or prevent the code form being read by the reader.
- The individual card or tag shall be derived from a population of at least 134 million unique codes.
- Cards or tags shall be sequentially numbered. The user may specify codes or numbers. Exact replacements for cards or tags, which may be lost, damaged, or stolen shall be available upon request. Cards and tags having the same number shall also be available upon request.
- Cards, key ring tags, or badge tags may be used interchangeably and shall be compatible with all readers in the system, regardless of the reader's physical size or style, and without any code matching or memory devices in the reader.

Type: HID iClass or Indala

2.10.0 FIELD HARDWARE

A. DOOR CONTACT / STATUS SWITCH

UL Listed
¾" diameter recessed magnetic contacts with factory installed wire leads, minimum 1 ft. long – 22AWG.
Installation shall include the application of mounting compound for added adhesive strength.
Where field conditions prohibit the use of a recessed magnetic contact, surface mounted

switch shall be used.
Type: Interior/Exterior, Sentrol 1078 Series or equivalent
Gate/Overhead Door, Sentrol 2500 Series (w/bracket) or equivalent

B. REQUEST TO EXIT SWITCH

1 3/4" diameter opaque colored mushroom cap push button
Type: Rutherford Controls 908 Series or equivalent.
Operation: Momentary N.O. and N.C. DPDB Circuits

C. PROXIMITY CARDS
Dimensions: 3.38” x 2.12” x 0.03”
Type: HID iClass 2K ISO Style
Material: PVC
Slot Punch: Vertical/Horizontal
Permanent Marking: Includes P/N code, date code and ID number matching internal ID

E. GLASS BREAKAGE DETECTOR

UL Listed
FCC Certified
Detection range 25’ minimum
Mounting locations at the wall or ceiling.
Type: Sentrol Shatter Pro II Series (5820A) or equivalent.
Recessed or Flush Mount, Tamper available
Operation: 25’, 360° opposed.

F. PASSIVE INFRARED SENSOR

UL Listed
FCC Certified
Available in various designs to provide coverage of 30 ft. to 200 ft. depending upon the area of protection
Combination heat and motion sensitive detection technologies, both needed to verify alarm condition (dual- technology).
Ability to disable LED for Stealth mode
Sequential Logic Input
Automatic PIR temperature compensation
Catch sensitivity: 1ft. per second
Trouble output supervisory feature
Phase sensitive PIR processing
Ceiling, wall, corner, flush, and swivel mountable brackets to be available.
Type: Detection Systems 160i or equivalent

G. LOCKING DEVICES

All locking devices providing access are to be of the electromagnetic type to meet the following requirements as outlined below:

- Approved by the authority having jurisdiction, including local fire authorities to provide free egress at all times.
- Type: Electrified handsets, electric strikes
- UL listed
- Each door to be provide with an integral door status switch and magnetic bond sensor
- It will be up to the individual security contractor to provide the proper door locking equipment for each individual controlled door.
- All locking devices utilized on passages providing a main means of egress out of a protected space are to meet fire code and approved by the authority having jurisdiction, including local fire authorities
- Shall meet NFPA 101 Life Safety Code requirements
- UL listed
- Shall receive power from the lock power supply

J. POWER SUPPLY

Provide:

- Power supply rated for the total load of the control station for all input and output modules energized, without diversity.
- Protection against power surges and over voltages.
- Battery backup to support panel memory for a minimum of 72 hours.
- Battery backup to support electric locks for a minimum of 4 hours.
- Individually fused outputs.
- 24-volt AC/DC control circuits throughout.
- The same type and manufactured power supplies shall be used for both the SMS and DVMS systems.

2.11.0 Digital Video Management System (DVMS)

The digital video management system shall be a rack-mountable box that allows for the recording, live viewing, and playback of recorded video for periods of up to 120 days without the need for offline storage to digital tape, CDRW, or DVDRW. The DVMS system shall perform all viewing, playback, and video storage functions simultaneously.

The DVMS system shall be integrated into the SMS system to provide a seamlessly integrated system that allows the automatic storage of alarmed video. Alarm criteria may be presented directly to the DVMS system or to the SMS system. Alarm activity presented directly to the DVMS system shall also be reported to the SMS systems alarm database log for future reviewal.

Video shall be displayed on a standard PC monitor, and configuration shall be performed with a standard mouse and keyboard. The DVMS system shall be configured using an application interface and shall record video continuously, only during alarm events, or only while activity is present. Each camera shall be able to record in different modes and on different schedules or using the same schedule and configuration.

Local and remote interfaces shall allow for easy search and retrieval of video from the DVMS system, SMS system, and network computers. The DVMS system shall allow users defined parameters based upon multiple criteria when searching for previously recorded video files.

The DVMS system shall:

- Be a PC-based video processor and recorder operating in a Windows operating system environment.
- Have the internal capacity to monitor and record up to 32 individual cameras regardless of camera type and mode. The primary connection type for the DVMS system shall be BNC connector.
- Have the ability to provide individual looping outputs for every video input.
- Have up to 16 individual alarm inputs.
- Provide up to 4 individual audio inputs with a single audio output.
- Have the ability to control multiple PTZ cameras at the same time regardless of manufacturer.
- Record no less than 120 images per second NTSC.
- Have 4 switched analog video outputs shall be available per unit.
- Have a built-in CD/RW drive for quick archiving.
- Have the ability to display multiple cameras at the same point in time regardless of their location within the overall DVMS system.
- Have the ability to reset the system upon unauthorized actions or system failures.

2.11.1 DVMS Recording

The DVMS system shall record all connected video signals in a non time-lapse mode. The DVMS system shall include multiple Digital Video Recorder (DVR's). Each DVR shall have the built-in capacity to record a total of 120 images per second. Each DVR provided shall record no less than 5 images per second per camera at no less than 2CIF resolution for a period of no less than 31 days. It will be the responsibility of the contractor to provide ample documentation to prove that the solution provided meets these criteria.

2.11.2 DVMS Control

The DVMS system shall be controlled from multiple locations at the same time.

Local Control – The DVMS system shall provide operators the ability to control all aspects of the system through a standard keyboard and mouse.

SMS Control – Through the integration with the SMS system operators of the system shall have the ability to manipulate the DVMS system from the SMS front end. This manipulation shall include, but not be limited to, the following:

- Full PTZ camera control
- Individual and multiple cameras call up to the SMS system regardless of the cameras location within the overall DVMS system. Camera call up shall be achieved through the SMS graphics pages.
- Recorded video call up with rewind, pause, play, and fast-forward controls.
- The ability to print paused video to a network printer
- Change the recording parameters of each individual camera including resolution, record rate, recording priority.
- Preset programming and selection.

Remote Control – The DVMS system shall have the built-in capability to be connected to the customers WAN. This connection will provide operators of the system the ability to take full control of any single camera, DVR, multiple cameras, and multiple DVS's all at the same point in time. The remote control connection shall provide operators of the system the ability to view both live and recorded cameras. It is imperative that the remote control connections provide operators of the system the ability to monitor multiple cameras at the same point in time regardless of their physical location. Individual web/html pages will not be acceptable.

This connection will also be available to the customers in-house police department for use in their patrol vehicles. It will be up to the individual contractor to ensure compatibility with the networking equipment currently being used in the police cars.

2.11.3 DVMS System

The DVMS system shall be the DVXi or DS Express system as manufactured by Integral Technologies with the appropriate amount of on-board storage capability to meet the recording criteria indicated above.

2.11.4 DVMS Cameras

Cameras connected to the DVMS system shall all be color cameras that have the ability to operate in low light environments. All cameras shall have dual processing chips providing both color and B&W operation.

Fixed Cameras – Fixed cameras shall be smoked dome type cameras with vari-focal lenses. These cameras shall provide, at a minimum, 470 lines of resolution, with a lux rating of .08. Fixed cameras shall be Panasonic WV-CW474 or approved equal. Cameras shall be surface mounted.

PTZ Cameras – PTZ Cameras shall be self-contained units with built-in lenses capable of zooming in to a minimum of 220x. The cameras shall provide, at a minimum, 470 lines of resolution, with a lux rating of .04. PTZ cameras shall be Panasonic WV-CW964 with the appropriate mounting hardware to fit each application.

2.11.5 DVMS Monitors

The DVMS system shall include video monitors to present the video signals to the operators. All monitors shall be 17" LCD monitors at a minimum.

2.11.6 Square D Lighting Integration

The system shall have the ability to seamlessly integrate with the lighting control system through the use of a software connection. This interface shall provide the operator the ability to individually control lighting circuits for on/off, schedule each individual lighting circuit for on/off, and enable security lighting in the event of an alarm condition from the security system.

Control of the individual lighting control circuits shall be achieved through the use of integrated facility graphics pages. Each lighting circuit shall be displayed on a floor plan.

The interface shall be provided through a software interface. Intermediate relay boards or gateways are not acceptable.

PART 3 EXECUTION

3.01 INSTALLATION

Install all devices in locations as shown on the drawings in accordance with standard industry practice.

Install and adequately support fixed wiring throughout the installation. For cabling routes not specified in detail, submit a proposed route layout.

Handling cables: Handle cables to avoid damage to insulation and sheathing. Report any damage and replace or repair-damaged cable as directed.

Straight-through joints: Unless unavoidable due to length or difficult installation conditions, run cables for their entire route length without intermediate straight-through joints. Where straight-through joints are used contain within a junction box arranged so that they are accessible after installation.

Tagging: Identify all cables at each end and at crowded intermediate points by means of stamped, non-ferrous tags, clipped around each cable.

Fire Caulking: Provide the appropriate penetration caulking.

Cables in false ceilings: Secure from building structure, not from other services.

Cables in conduits: Feed cables into conduits in such a way as to prevent twisting and crossing. Do not use inspection fittings for drawing in cables.

Cables on trays and ladders: Fix cables neatly to trays and ladders in single layers and parallel to the tray edge to avoid unnecessary crossovers. Fix cables at intervals not exceeding 48” by means of non-corrosive fastening materials.

Segregation: Physically segregate data cabling from power and SMS input/out cabling and mains cabling from all other cabling.

PANELS

Install panels and controllers within a dedicated metal enclosure.

Documentation: Provide plastic fade-free points list in a pocket. Include terminal numbers, point addresses and short and long descriptions.

Small point controllers: Install adjacent to the controlled device, accessible for maintenance. Provide suitable enclosure.

3.02 TRANSMISSION SYSTEMS

The SMS shall utilize the above LAN architecture to allow all of the Control Units to share data as well as to globalize alarms. The Controller LAN shall be based upon a peer-to-peer, token passing technique with a data speed of not less than 19.2 KB.

Each individual SMS control panel shall have the ability to maintain 100% of the information needed for it to operate in the event it is disconnected from the rest of the system. Systems that require a "master" communications controller or network manager for the database storage and alarmed and activity buffering or operate in a degraded site-code mode are not acceptable.

3.03 COMMUNICATIONS

Utilize an established LAN or other communication standard to link all SMS equipment.

Technique: Token Passing network for Controller LAN, Polled for Small Point & Application Specific Controllers.

Configuration: A break in the communication path of the Controller LAN shall be announced as an alarm and shall automatically initiate a Controller LAN reconfiguration such that the resulting sections of the Controller LAN continue to function as separate LANs. No loss of control shall result from such a break in the Controller LAN.

Commercial LAN: Workstations on the Controller LAN may also reside on a higher tier "commercial" LAN. This "commercial" LAN shall be based upon Ethernet, and comply with IEEE 802.3 standards. Where a "commercial" LAN is implemented, it shall be possible to connect multiple Controller LANs together, with global data sharing across this commercial LAN.

Alarms and special event notices shall be routed to different workstations on the "commercial" LAN-based upon time of day, and day of the week.

Operator password assignment shall be available on both a system-wide basis and a workstation-by-workstation basis.

3.03 TESTING AND COMMISSIONING

A. GENERAL

The contractor shall perform all tests submitted in the “Test Procedure” section as outlined in the specification.
Provide a program for the testing and commissioning procedure. Use a qualified representative of the SMS supplier to co-ordinate testing and present at all tests and training courses and remain on-site until the SMS is fully operational.

B. FACTORY TESTING

Procedure: Submit procedure for factory test at least two weeks prior to the test.

After test: Submit summary of results and necessary modifications.

C. SITE TESTING AND COMMISSIONING

Carry out the following:

- Attendance at the testing of all equipment that interfaces to the SMS and confirmation of the operation of such equipment from the SMS interface terminals.
- Testing of all field wiring from terminals to field interface terminal strips.
- Testing and commissioning of all power supplies and batteries.
- Verification of communication to remote systems.
- Testing of the operation of each control point from the operator's workstation (if supplied) and verification of the status of all points and alarm functions on graphic displays.

Demonstrate the following:

- Operation of each control loop.
- Globally transferred information such as alarms.
- Detection and action of all alarm conditions.
- Communications with PC workstations.
- Time schedules and after-hours operation.
- Mapping of system points to operator's workstation(s).
- Operator's workstation software.
- Power fail re-starts.
- Essential power mode operation.
- Fire mode of operation.
- Telecommunication facilities.
- DVMS integration for live and recorded images.

B. FINAL ACCEPTANCE TEST:

After the testing report and as built drawings have been approved by the customer's representative, the completed system shall be tested in the presence of the customer's representative.
Acceptance of the system shall require a demonstration of the stability of the system. Should major equipment failure occur, the contractor shall replace or repair component (s). This test shall not start until the customer has obtained 30 days beneficial use of the system.

3.04 NOTICE OF COMPLETION

When the final acceptance test described above has been satisfactorily completed, the contractor shall issue a letter of completion to the customer indicating the date of such completion. The notice of completion shall be recorded by the contractor upon receipt of the customer completion letter. This date of record shall be the start of the one-year guarantee period.

END OF SECTION