PERFORMING ARTS CENTER ELEVATOR MODERNIZATION

INVITATION TO BID NO. 2022C040

Municipality of Anchorage
Maintenance & Operations
Capital Projects
PO Box 196650
Anchorage, AK 99519

MUNICIPALITY OF ANCHORAGE
MAINTENANCE AND OPERATIONS DEPARTMENT
CAPITAL PROJECTS

PERFORMING ARTS CENTER ELEVATOR MODERNIZATION

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MUNICIPALITY OF ANCHORAGE
PURCHASING DEPARTMENT

Invitation to Bid

No. 2022C040

Sealed bids will be received in accordance with the time schedule shown below by the Municipality of Anchorage at the Purchasing Department, 632 W. 6th Ave., Suite 520, Anchorage, Alaska 99501 for:

PERFORMING ARTS CENTER ELEVATOR MODERNIZATION

Description: Freight elevator modernization. Architectural, Mechanical and Electrical improvements.

ESTIMATED CONSTRUCTION COST: **Between: $200,000 - $3,00,000**

SITE VISIT:

Site Visit:	**10:00 A.M. Local Time, September 20, 2022** **621 W. 6th Ave,. Anchorage, AK 99577,** **Back entrance at 5th and G Street**
Pre-Bid Conference:	**N/A**
Questions Due:	**12:00 P.M. Local Time, September 22, 2022**
Bid Opening:	**2:00 P.M. Local Time, September 29, 2022**

All Pre-Bid Conferences and/or Bid Openings may be attended in person or via conference call at this number (907) 343-6089. You may call in five (5) minutes before any scheduled conference. EMAILED BIDS WILL NOT BE ACCEPTED.

ALL QUESTIONS SHALL BE SUBMITTED PRIOR TO THE QUESTION DUE DATE THIS WILL BE THE FINAL OPPORTUNITY TO ASK QUESTIONS OR REQUEST CLARIFICATIONS.

Requests for interpretation or clarification of the bidding Documents shall be made in writing to the Purchasing Office (wwpur@muni.org). Please reference the Invitation to Bid Number & Project Title. Do not contact the specified department directly.

To maintain the project schedule, Interpretations, corrections, or changes to the Bidding Documents shall be made by Addendum and shall not be binding unless included in the Addendum. It is your responsibility to periodically check the website for addenda.

At the above indicated time, the bids will be opened publicly and read. Bids must be received by the Purchasing Officer prior to the time fixed for opening of the bids to be considered. Time of receipt will be as determined by the time stamp in the Purchasing Office, Suite 520.

The Municipality of Anchorage reserves the right to reject any and all bids and to waive any informalities in the bids. No bidder may withdraw his bid after the hour set for the opening of bids or before the award of contract unless said award is delayed for a period exceeding forty-five (45) days from the time of the opening.

The Municipality shall not be responsible for bid preparation costs, nor for costs, including attorney fees, associated with any (administrative, judicial or otherwise) challenge to the determination of the lowest responsive and responsible bidder and/or award of contract, and/or rejection of bids. By submitting a bid, each bidder agrees to be bound in this respect and waives all claims to such costs and fees.

Contracts shall be awarded by written notice issued by the Purchasing Officer to the lowest responsive and responsible bidder; however, preference will be given to local bidders in compliance with Anchorage Municipal Code Section 7.20.040.

The Municipality of Anchorage assumes no responsibility for any interpretations or presentations made by any of its officers or agents unless such interpretations or presentations are made by written addendum to this Invitation to Bid.

Bonding Requirements are per MASS/MASS B or as per special provisions

THE MUNICIPALITY OF ANCHORAGE IS AN "EQUAL OPPORTUNITY EMPLOYER"

PUBLISH ONE TIME

Date: September 8, 2022

Senior Buyer Assigned to this Project:
Melanie A. Clark

Chris Hunter
Deputy Purchasing Director

BIDDER'S CHECKLIST

INSTRUCTION TO BIDDER

I. GENERAL:

Bidders are advised that notwithstanding any instructions or implications elsewhere in this Invitation to Bid only the documents shown and detailed on this sheet need be submitted with and made part of their bid. Other documents may be required to be submitted after bid time, but prior to award. Bidders are hereby advised that failure to submit the documents shown and detailed on this sheet shall be justification for rendering the bid nonresponsive. Evaluation of bids for responsiveness shall be accomplished in accordance with Anchorage Municipal Code, Title 7.

II. REQUIRED DOCUMENTS FOR BID

NOTE: "Only the following listed items as marked with an "X" are required to be completely filled out and submitted with the bid."

__X__ Bid Proposal consisting of two (2) pages numbered 00 41 13 - 1 through 00 41 13 - 2
Bid Proposal Page **00 41 13 - 2 must** be manually signed.

__X__ Erasures or other changes made to the Bid Proposal Sheet must be initialed by the person signing the bid.

__X__ Bid Bond, certified check, cashier's check, money order or cash shall be submitted with the bid in the amount indicated.

__X__ All Addenda issued shall be acknowledged in the space provided on the Bid Proposal sheet or by manually signing the Addenda sheet and submitting it prior to the bid opening in accordance with Anchorage Municipal Code 7.20.020C.

III. REQUIRED DOCUMENTS AFTER BID OPENING

The following documents are required within **five (5)** working days of notification by the Purchasing Office. Failure, in whole or in part, to submit the documents required below may be grounds to determine the Bidder as non-responsible.

__X__ In accordance with AO No. 2019-130 (S), Anchorage Municipal Code 7.20.030 and 7.20.070, Contractor Questionnaire consisting of three (3) Pages, Prime Contractor Form Filled out by Prime Contractor **and** all known subcontractors. **Please review AO NO. 2019-130 (S), AMC 7.20.030 and 7.20.070, and the attached Contractor Questionnaire before submitting a bid.**

Municipality of Anchorage
Contractor Questionnaire

Contractors/Vendors wishing to qualify for award of a bid or proposal offered by the Municipality of Anchorage shall submit this completed form and any supplemental information requested by this form within five days following a request by the Purchasing Officer.

This form is to be filled out by the prime, and subcontractors that perform work "on-site". On-site is defined as the physical place or places where the building or work called for in the contract will remain, and any other site where a significant portion of the building or work is constructed, provided that such site is established specifically for the performance of the contract or project.

Contractor/Vendor Name: _____

Owner(s) of Company (if sole proprietorship or partnership): _____

_____

List all Alaska construction contractor's registration numbers, registration types and expiration dates of the Alaska business licenses held by your company in the past three years:

_____

_____

Has your company changed names, business license number, or contractor registration number in the past three years?

☐ Yes ☐ No

If "Yes," explain on a separate signed page, including the reason for the change.

Has any owner, partner or (for corporations) officer of your company operated any business offering similar services outlined in the bid or proposal under any other name in the past three years?

☐ Yes ☐ No

If "Yes," explain on a separate signed page, including the reason for the change.

Certifications & Disclosures

For these questions & certifications, "company" includes any entity that shares or has shared majority ownership or control with your company. "Determination of violation" includes any citations, orders or recommendations issued to or against the company.

Debarment

1. In the last three years has your company been debarred from bidding on, or being awarded, a state or federal project?

   ☐ Yes ☐ No

Occupational Safety & Health

Note: Only willful violations of state or federal occupational safety and health laws will result in disqualification; disclosure of other violations does not lead to automatic disqualification.

2. In the last three years has your company been determined to have committed a **willful violation** of state or federal occupational safety and health law? For purposes of this question, a state or federal occupational safety and health law includes laws enforced by the Occupational Safety and Health Administration (OSHA), Alaska Occupational Safety and Health (AKOSH), or another state's occupational safety and health agency.

   ☐ Yes ☐ No

3. In the last three years, has the federal Occupational Safety and Health Administration (OSHA), Alaska Occupational Safety and Health (AKOSH), or another state's occupational safety and health agency, made a determination of violation against your company?

   Note: If you have filed an appeal of a citation and the appropriate appeals board has not yet ruled on your appeal, you need not include information about it.

   ☐ Yes ☐ No

   If "Yes," attach a separate signed page describing each citation.

Wage & Hour

Note: Only willful violations of state or federal wage and hour laws will result in disqualification; disclosure of other violations does not lead to automatic disqualification.

4. In the last three years has your company been determined to have committed a **willful violation** of state or federal wage and hour law?

   ☐ Yes ☐ No

5. In the last three years has there been a determination of violation of wage and hour laws against your company? Wage and hour violations include failure to pay minimum wages, overtime, or prevailing wages.

   ☐ Yes ☐ No

   If "Yes," attach a separate signed page describing each violation, identifying the claim by claimant, date, and status/outcome.

Unemployment Insurance & Workers' Compensation

6. In the last three years has there been a determination of violation of unemployment insurance or workers' compensation requirements against your company?

   ☐ Yes ☐ No

   If "Yes," attach a separate signed page describing each violation, identifying the claim by claimant, date, and status/outcome.

Licensing & Registration

7. If a license or certificate of fitness is required to perform any services provided by your company, has there been a determination of violation of any certificate of fitness requirements against your company in the last three years?

   ☐ Yes ☐ No

   If "Yes," attach a separate signed page describing each violation, identifying the claim by claimant, date, and status/outcome.

Subcontracting

8. I certify that all independent subcontractors engaged by my company meet the definition of an independent contractor under Alaska Statute 23.30.230.

   ☐ Yes ☐ No

9. I understand that my company is responsible for ensuring that each subcontractor my company uses on the project completes this form and associated documentation. I will submit any disclosures required by Anchorage Municipal Code.

   ☐ I understand

10. I understand that my company is responsible for providing this form and any associated documentation for each subcontractor hired after award within 30 days of hire, and that the subcontractor may not begin work on the project until such information is provided.

    ☐ I understand

11. I understand that my company is responsible for ensuring that if any event, such as a violation or loss of coverage, causes the information submitted by the subcontractor to change, the subcontractor shall submit updated certifications or disclosures within 30 days of occurrence to the department contract administrator.

    ☐ I understand

I declare under penalty of perjury that the foregoing is true and correct.

Dated: _____ _____
(Signature)

_____
(Printed name and title)

Right to Appeal: Anchorage Municipal Code provides that any person adversely affected in connection with the award of a municipal contract, including the Municipality's determination on responsibility, may request that the mayor or assembly refer the matter to the bidding review board.

BID PROPOSAL
(CERTIFICATION)

TO: MUNICIPALITY OF ANCHORAGE _____, 2022
PURCHASING DEPARTMENT
632 W. 6TH AVENUE, SUITE 520
ANCHORAGE, ALASKA 99501

SUBJECT: Invitation to Bid No**. 2022C040**

PROJECT TITLE: Performing Arts Center Elevator Modernization

Pursuant to and in compliance with subject Invitation to Bid, and other bid documents relating thereto, the bidder hereby proposes to furnish all labor and materials and to perform all work for the construction of the above referenced project in strict accordance with the bid documents at the prices established in the Bid Proposal, page **00 41 13 – 1 through 00 41 13 - 2** submitted herewith.

The bidder agrees, if awarded the contract, to commence and complete the work within the time specified in the bid documents.

LUMP SUM; ONE JOB $_____

The bidder acknowledges receipt of the following addenda:

Addenda No._____ Addenda No. _____
Addenda No._____ Addenda No. _____
Addenda No._____ Addenda No. _____

Enclosed is a Bid Bond in the amount of _____.
(Dollar Amount or Percentage of Bid)

Type of Business Organization
The bidder, by checking the applicable box, represents that it operates as ( ) a corporation incorporated under the laws of the State of _____, ( ) an individual, ( ) an LLC, ( ) a partnership, ( ) a nonprofit organization, or ( ) a joint venture. If a partnership or joint venture, identify all parties on a separate page

Is this project Federally Funded?
Yes ☐
No ☒

_____
Company Name

BID PROPOSAL
(CERTIFICATION)
Continued

SUBJECT: Invitation to Bid No**.** **2022C040**

PROJECT TITLE: Performing Arts Center Elevator Modernization

Date	Alaska Contractor's License Number
Company Name (Printed)	Employer's Tax Identification Number
Authorized Representative Signature	Printed Name & Title
Company **Mailing** Address	Company Phone Number
City, State, Zip Code	Company Fax Number
Company **Physical** Address (if different from mailing address)	Company Email Address
City, State, Zip Code	

BID BOND

KNOW ALL MEN BY THESE PRESENTS, That we,_____
as Principal, and_____
_____a corporation organized under the laws of the_____
_____and authorized to transact surety business in the
State of Alaska, of_____
as Surety, and held and firmly bound unto the MUNICIPALITY OF ANCHORAGE, as Obligee, in the full and just sum of_____
_____($_____) Dollars, lawful money of the UNITED STATES, for the payment of which sum, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents. WHEREAS, the said Principal is herewith submitting its proposal for _____
_____

The condition of this obligation is such that if the aforesaid Principal will, within the time required enter into a formal contract and give a good and sufficient bond to secure the performance of the terms and conditions of the contract, then this Obligation to be void; otherwise the Principal and Surety will pay unto the Obligee the amount stated above.

Signed, sealed, and delivered _____, 20_____.

WITNESS AS TO PRINCIPAL:

_____ _____
Contractor Name

_____
Contractor Signature

_____
(AFFIX CORPORATE SEAL) Corporate Surety

_____

_____
Surety Business Address

(AFFIX SURETY SEAL) By_____
(Attorney-In-Fact)

C O N T R A C T

Invitation to Bid No. **2022C_____**

Contract No. **C-2022_____**

NAME AND ADDRESS OF CONTRACTOR:

_____

_____

_____

Check appropriate box:

☒ **Incorporated in the State of**

MUNICIPALITY OF ANCHORAGE, acting through _____ (hereinafter the Owner).

Contract for _____

BID SCHEDULES	**ITEMS**	**PLAN SHEET FILE NUMBERS**	**AMOUNT**
			$ _____

Total Amount : $ _____

THIS CONTRACT, entered into by the MUNICIPALITY OF ANCHORAGE, ALASKA, acting through the Owner named above, and the individual, partnership, or corporation named above, hereinafter called the Contractor, WITNESSETH that the parties hereto do mutually agree as follows:

Statement of Work: The Contractor shall furnish all labor, equipment and materials and perform the Work above described, for the amount stated, in strict accordance with the Contract Documents.

CONTRACT DOCUMENTS

I. This CONTRACT consisting of 4 pages.

II. The Bid Proposal Section ___ consisting of ____ pages numbered as ____, **as contained in ITB 2022C_____.**

III. The Contract Performance and Payment Bond **_____.**

IV. The Contractor's Certificate of Insurance Dated **_____.**

V. Municipality of Anchorage Standard Specifications dated 2015 (MASS) Incorporated by Reference, **as contained in ITB 2022C_____.**

VI. Specifications consisting of the following:

Supplemental Provisions Section _____ consisting of _____ pages, with attachments Exhibit A through F, **as contained in ITB 2022C_____.**

VII. Equal Opportunity Special Provisions and Forms Section _____ consisting of _____ pages, **as contained in ITB 2022C_____.**

VIII. Disadvantaged/Women-Owned Business Enterprise (DBE/WBE) Specification Section _____ consisting of _____ pages, **as contained in ITB 2022C_____.**

IX. The Laborers' and Mechanics' Minimum Rates of Pay dated September 1, 2015 Section _____ consisting of _____ pages, **as contained in ITB 2022C_____.**

X. Submittal List Section _____ consisting of _____ page, **as contained in ITB 2022C_____.**

XI. The Drawings consisting of _____ sheets numbered _____, **as contained in ITB 2022C_____.**

IN WITNESS WHEREOF, the parties hereto have executed this Contract as of the Contract Date entered below.

MUNICIPALITY OF ANCHORAGE, ALASKA

BY _____
Signature

Purchasing Officer or designee
Title

Date of Signature and Contract Date:

_____

VENDOR _____

BY _____
Signature

_____
Printed Name

_____
Title

_____
Date of Signature

CONTRACT AND PERFORMANCE AND PAYMENT BOND SIGNATURE INSTRUCTIONS

1. The full name and business of the Contractor shall be inserted on Page 1 of the Contract and on the Performance and Payment Bond, hereinafter the Bond.
2. Two copies of the Contract and the Bond shall be manually signed by the Contractor. If the Contractor is a partnership or joint venture, all partners or joint ventures shall sign the Contract and the Bond except that one partner or one joint venturer may sign for the partnership or joint venture when all other partners or joint venturers have executed a Power-of-Attorney authorizing one partner or joint venturer to sign. The Power-of-Attorney shall accompany the executed contract and the Bond.
3. If the Contractor is a corporation, the President of the corporation shall execute the Contract and the Bond unless a Power-of-Attorney or corporate resolution shall accompany the executed Contract and Bond.
4. The Bond shall be returned to the Purchasing Division undated. The Contract Date shall be inserted on the Contract when the Municipality signs the Contract and the Bond shall be dated the same as the Contract Date.

CONTRACT PERFORMANCE AND PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, That we _____ _____ of _____ as Principal, and _____ a corporation organized under the laws of the _____ _____ and authorized to transact surety business in the State of Alaska, of _____ as Surety, are held and firmly bound unto the MUNICIPALITY OF ANCHORAGE, as Obligee, in the full and just sum of _____ ($ _____) Dollars, lawful money of the UNITED STATES, for the payment which, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION IS SUCH, that whereas the principal has entered into a certain contract dated the _____ date of _____ 20 _____, with the Obligee for the construction of _____

_____

which contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW THEREFORE, if the Principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said contract, and shall promptly make payments to all persons supplying labor and material in the prosecution of the work provided for in said contract, during the original term of said contract and any extensions of modifications thereof that may be granted by the Municipality, with or without notice to the Surety, then this obligation to be void; otherwise to remain in full force and effect.

This obligation is made for the use of said Obligee and also for use and benefit of all persons who may perform any work or labor or furnish any material in the execution of said Contract and may be sued on thereby in the name of said Obligee.

This said Surety, for the value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same, shall in anywise affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the work or to the specifications.

Whenever Principal shall be, and declared by Obligee to be in default under the Contract the Obligee having performed Obligee's obligations thereunder, the Surety may promptly remedy the default or shall promptly:

1. Complete the Contract in accordance with its terms and conditions, or
2. Obtain a bid or bids for submission to Obligee for completing the Contract in accordance with its terms and conditions and upon determination by Surety of the lowest responsible bidder, or, if the Obligee elects, upon determination by Obligee and the Surety jointly of the lowest responsible bidder, arrange for a contract between such bidder and Obligee and make available as Work progresses (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract price but not exceeding, including other costs and damages for which the Surety may be liable hereunder the amount set forth in the first paragraph hereof. The term "balance of the contract price" as used in this paragraph, shall mean the total amount payable by Obligee to Principal under the Contract and any amendments thereto, less the amount properly paid by Obligee to Principal.

IN TESTIMONY WHEREOF, the parties hereunto have caused the execution hererof in _____ _____ original counterparts as of the _____ day of _____, 20_____.

WITNESS AS TO PRINCIPAL:

_____ _____

Principal Name

_____

Principal Signature

(AFFIX CORPORATE SEAL) _____

Corporate Surety

_____

_____

Surety Business Address

(AFFIX SURETY SEAL) BY: _____

(Attorney-In-Fact)

INSURANCE

By submitting a bid, the bidder agrees, if they are the successful bidder, to obtain and maintain the insurance required by this section. The bidder also agrees to provide the Municipality a copy of their Certificate of Liability Insurance prior to signing the contract and prior to commencement of any work under this contract.

GENERAL: The Contractor will not allow any subcontractor to commence work until the subcontractor has obtained insurance as listed in this section. The contractor and each subcontractor shall maintain this insurance throughout the life of this contract, including any maintenance and/or guarantee/warranty period. The contractor shall obtain separate insurance certificates for each contract.

ADDITIONAL INSURED: The Municipality of Anchorage shall be listed as an additional insured on all General and Auto Liability policies required by this contract. All policies shall contain a waiver of subrogation against the Municipality, except Professional Liability. All policies shall remain in effect during the life of the contract. The Contractors insurance certificate shall also indicate the Municipality of Anchorage as a certificate holder of the policy.

WORKERS COMPENSATION: The Contractor shall purchase and maintain during the life of this contract, workers compensation insurance for all employees who will work on this project and, if any work is sublet, the Contractor shall require the subcontractor similarly to provide such insurance. Employers' Liability with a minimum limit of $500,000 shall be maintained and Workers Compensation with minimum limits as required by Alaska State Workers Compensation Statutes. The policy shall contain a waiver of subrogation against the Municipality.

NOTICE TO "OUT-OF-STATE" CONTRACTORS WORKING IN ALASKA: The Contractor shall provide evidence of Workers Compensation insurance, either State of Alaska Workers Compensation coverage or an endorsement to the Contractor's home state Workers Compensation policy, evidencing coverage for "other states" including Alaska, prior to execution of a contract or, if approved, before commencement of contract performance in Alaska.

GENERAL LIABILITY: The Contractor shall purchase and maintain, in force, during the life of this contract such general liability insurance as shall protect the Owner and the Contractor against losses which may result from claims for damages for bodily injury, including accidental death, as well as from claims for property damages which may arise from any operations under this contract whether such operations be those of the Contractor, a subcontractor or anyone directly or indirectly employed by either of them.

Commercial General Liability	**Minimum Limits**
Products/Completed Operations	$2,000,000
Personal & Advertising Injury	$1,000,000
Each Occurrence	$1,000,000
General Aggregate	$2,000,000
Medical Payments	$5,000
Commercial Auto Liability	**Minimum Limits**
Combined single limit (Bodily Injury and Property Damage)	$1,000,000
Including all owned, hired, and non-owned	
Workers Compensation and Employers Liability	**Minimum Limits**
Per Alaska statute	$500,000
Errors and Omissions	**Minimum Limits**
Professional Liability (Not required unless limits appear in space provided)	
Umbrella Liability	**Minimum Limits**
(Not required unless limits appear in space provided)	
$ _____ S.I.R.	

Each insurance policy required by this section shall require the insurer to give advance notice to the MOA/Contract Administrator prior to the cancellation of the policy. IF the insurer does not notify the MOA upon policy cancellation, it shall be the Contractor's responsibility to notify the MOA of such cancellation.

COMPLIANCE WITH LAWS

The Contractor shall observe and abide by all applicable laws, regulations, ordinances and other rules of the State of Alaska and/or any political subdivisions thereof, or any other duly constituted public authority wherein work is done or services performed, and further agrees to indemnify and save the Municipality of Anchorage harmless from any and all liability or penalty which may be imposed or asserted by reason of the Contractor's failure or alleged failure to observe and abide thereby.

(Remainder of Page Initially left Blank)

ACORD®

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) shall be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:	
	PHONE (A/C, No, Ext):	FAX (A/C,
	E-MAIL ADDRESS:	

INSURED	INSURER(S) AFFORDING COVERAGE	NAIC #
	INSURER A :	
	INSURER B :	
	INSURER C :	
	INSURER D :	
	INSURER E :	
	INSURER F :	

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
	GENERAL LIABILITY						EACH OCCURRENCE	$
	☐ COMMERCIAL GENERAL LIABILITY						DAMAGE TO RENTED PREMISES (Ea occurrence)	$
	☐ ☐ CLAIMS-MADE OCCUR						MED EXP (Any one person)	$
	☐						PERSONAL & ADV INJURY	$
	☐						GENERAL AGGREGATE	$
	GEN'L AGGREGATE LIMIT APPLIES PER:						PRODUCTS - COMP/OP AGG	$
	☐ POLICY ☐ PRO - ☐ LOC							$
	AUTOMOBILE LIABILITY						COMBINED SINGLE LIMIT (Ea accident)	$
	☐ ANY AUTO						BODILY INJURY (Per person)	$
	☐ ALL OWNED AUTOS ☐ SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	☐ HIRED AUTOS ☐ NON-OWNED AUTOS						PROPERTY DAMAGE (Per accident)	$
								$
	☐ **UMBRELLA LIAB** ☐ OCCUR						EACH OCCURRENCE	$
	☐ **EXCESS LIAB** ☐ CLAIMS-						AGGREGATE	$
	☐ DED ☐ RETENTION $							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N						☐ WC STATU-TORY LIMITS ☐ OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE ☐ N / A						E.L. EACH ACCIDENT	$
	OFFICER/MEMBER EXCLUDED? **(Mandatory in NH)**						E.L. DISEASE - EA	$
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - POLICY LIMIT	$

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

1. The Municipality of Anchorage is an additional insured on Auto and General Liability policies. All policies, including workers compensation, contain a WAIVER OF SUBROGATION against the Municipality, except Professional Liability, .
2. CANCELLATION: "Should any of the above described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the Policy Provisions."

CERTIFICATE HOLDER

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

Authorized Representative

CERTIFICATE OF COMPLIANCE

PERFORMING ARTS CENTER ELEVATOR MODERNIZATION

I (WE) HEREBY CERTIFY THAT ALL WORK HAS BEEN PERFORMED AND MATERIALS SUPPLIED IN ACCORDANCE WITH THE PLANS, SPECIFICATIONS AND CONTRACT FOR THE ABOVE WORK, AND THAT:

A. Not less than the prevailing rates of wages as ascertained by the governing body of the contracting agency has been paid to laborers, workmen, and mechanics employed on this work:

B. There have been no unauthorized substitutions of subcontractors' nor have any subcontractors been entered into without the names of the subcontractors have been submitted to engineer prior to the start of such subcontracted work.

C. No subcontract was assigned or transferred or performed by any subcontractor other than the original subcontractor, without prior notice having been submitted to the engineer together with the names of all subcontractors.

D. All claims for material and labor and other service performed in connection with these specifications have been paid.

E. All monies due the State Industrial Accident Fund, the State Unemployment Compensation Trust Fund, the State Tax Commission, hospital associations and/or others have been paid.

_____ _____

(Date) (Contractor)

IN WITNESS WHEREOF, the undersigned has signed and sealed this instrument this _____ day of _____ 2022

STATE OF ALASKA)
) ss
THIRD JUDICIAL DISTRICT)

THIS IS TO CERTIFY that on this _____ day of _____, 20___, before me, the undersigned, a Notary Public in and for the State of Alaska, personally appeared _____, known to me to be the individual named in the foregoing instrument, and he/she acknowledged to me that he/she executed the foregoing instrument as a free act and deed for the uses and purposes therein stated.

WITNESS my hand an official seal this day and year in this certificate first above written.

_____
Notary Public in and for Alaska
My commission expires: _____

MUNICIPALITY OF ANCHORAGE
STANDARD SPECIFICATIONS-BUILDINGS

(MASSB)
GENERAL CONDITIONS
SECTION 00 72 13
INDEX

GENERAL CONDITIONS
SECTION 00700

SECTION 00 72 13.01 DEFINITIONS

In these Contract Documents, the following words or expressions shall have the meaning given below:

AASHTO	-	American Association of State Highway and Transportation Officials
ACI	-	American Concrete Institute
ANSI	-	American National Standards Institute
API	-	American Petroleum Institute
APWA	-	American Public Works Association
ASA	-	American Standard Association
ASHRAE	-	American Society of Heating, Refrigeration and Air Conditioning Engineers, Inc.
ASTM	-	American Society for Testing and Materials
AWS	-	American Welding Society
AWWA	-	American Water Works Association
IBC	-	International Building Code
ICBO	-	International Conference of Building Officials
IEEE	-	Institute of Electrical and Electronics Engineers
IFC	-	International Fire Code
IMC	-	International Mechanical Code
ISO	-	Insurance Service Office
IPC	-	International Plumbing Code
MASS	-	Municipality of Anchorage – Standard Specifications
MASSB	-	Municipality of Anchorage – Standard Specifications/Buildings
NEC	-	National Electrical Code
NEMA	-	National Electrical Manufacturer's Association
NESC	-	National Electrical Safety Code
NFC	-	National Fire Code
NFPA	-	National Fire Protection Association
OSHA	-	Occupational Safety and Health Act

Addendum (Addenda) - Written or graphic communications issued prior to the execution of the Contract that modify or interpret the Bidding Documents and become part of the Contract Documents upon execution of the Contract.

Additional Work - Work not specifically provided for in the Contract as awarded but which is consistent with the original Scope of Work and for which a price for similar work is provided in the Contract.

Alternate – A defined portion of the work that is priced separately and provides options in the final scope of the project.

Architect/Engineer – The author and interpreter of the Contract Documents.

Assembly - The Anchorage Assembly of the Municipality of Anchorage.

Beneficial Occupancy Date - The date, established by the Owner's Representative, when construction is sufficiently completed in accordance with the Contract Documents and the Owner occupies or utilizes the Work, or a designated portion thereof, for the use for which it is intended.

Bid Proposal - The written proposal of the Bidder, on the form furnished, for the Work contemplated.

Bidder - Any individual, firm, partnership, corporation, or combination thereof formally submitting a Bid for the Work contemplated and acting directly or through an authorized representative.

Bidding Documents - The Invitation to Bid, Instruction to Bidders, Bidders Check List, Bid Forms, Contract Forms, Contract Conditions, Supplementary Conditions, Technical Specifications, Construction Drawings, and all Addenda.

Bid Guarantee - The security furnished by the Bidder as a guarantee to enter into a Contract for the Work contemplated if the Bidder is awarded the Contract.

Change Order/Request for Proposal – A written proposal prepared by the Contractor describing and documenting added costs or time extensions that the Contractor feels have been incurred due to unforeseen work and other matters not contemplated or adequately provided for in the Contract Documents.

Change Order/Contract Amendment - A written agreement entered into between the Contractor and the Owner to amend the Contract Documents or to otherwise provide for unforeseen work and other matters not contemplated or adequately provided for in the Contract Documents.

Contract - The four- (4-) page form agreement entitled "Contract" executed by the Contractor and then by the Owner on behalf of the Municipality. The Contract represents the entire and integrated agreement between the parties and supersedes all prior negotiations, representations, or agreements, either written or oral.

Contract Completion Date - The calendar date specified in the proposal for the full completion of all Work required by the Contract Documents, except as otherwise provided in the Contract.

If a number of calendar days is specified in the proposal for the completion of the Contract, the Contract Completion Date will be the specified number of days after the effective date of the Notice to Proceed, including authorized time extensions.

Contract Documents - The Contract and those documents described in page 2 of the Contract. The Contract Documents can only be amended by written Change Order. Instructions, clarifications, and directives issued by the Owner's Representative under Article 5.1 are not Contract Documents.

Contract Item (Bid Item, Pay Item) - A specifically described unit of Work for which a price is provided in the Contract.

Contractor - The individual, firm, corporation, partnership, or joint venture executing the Contract and performing the Work under the terms of the Contract Documents or, where applicable, the designated subcontractors or the employees of the individual, firm, corporation, partnership, or joint venture.

Days -

> **Calendar:** Unless otherwise designated in the Supplementary Conditions, days as used in the Contract Documents are consecutive calendar days.
>
> **Working:** A working day is defined as any day on which the Contractor is required to work by the Contract Documents or any other day not otherwise defined herein as a nonworking day.
>
> **Nonworking**: A nonworking day is defined as Sunday, a recognized holiday, a day on which the Contractor is specifically required by the Supplementary Conditions to suspend construction operations, or a day on which a suspension order is in effect. Recognized holidays shall be: New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, and Christmas Day. When any of the above days falls on a Saturday, the preceding Friday shall be counted as a holiday. When any of the above days falls on a Sunday, the following Monday shall be counted as a holiday.

Drawings - Graphic and textural information organized for the purpose of conveying data regarding design intent and construction requirements and listed and referred to on page 2 of the Contract.

Extra Work - Work not within the original Scope of Work but which is determined by the Owner's Representative to be essential for the satisfactory completion of the Contract.

Final Acceptance Date - The date on which the Work in its entirety has been constructed, inspected, accepted, and a Certificate of Completion issued, pursuant to the provisions of Article 5.27 - Final Inspection.

Furnish – To purchase and deliver to the Project.

Indicated - Shown on the Drawings, noted on Drawings, specified, or a combination thereof.

Inspector - The authorized representative of the Owner assigned to observe the Work.

Install – To set in place and make usable.

Liquidated Damages - The amount prescribed herein to be paid to the Owner, or to be deducted from any payments due or to become due the Contractor, for each day's delay in completing the whole or any specified portion of the Work beyond the time allowed in the Contract or as extended by the Change Order.

Municipality – The Municipality of Anchorage.

New Material and Equipment – Equipment and material that has not previously been used and is in production.

Necessary - Needed, as reasonably inferred from the Contract Documents, in order to make the Work complete and available for use.

Notice to Proceed - The written communication issued by the Owner to the Contractor authorizing the latter to proceed with the Work and that identifies the Owner's Representative and establishes the time of commencement and date of completion.

Notice-to-Resume - The written notice issued by the Owner's Representative that terminates a period of suspension of Work, reinstates the counting of Contract time, and requires the Contractor to resume Contract Work.

Or Equal - Whenever a material, article, or piece of equipment is identified on the Drawings or in the Project Manual by reference to manufacturers' or vendors' names, trade names, or catalog numbers, it is intended merely to establish a standard; and any material, article, or equipment of other manufacturers and vendors that will perform in an equal or better manner the duties imposed by the general design will be considered equally acceptable provided the material, article, or equipment so proposed will not require a change in the related work and is, in the opinion of the Owner's Representative, of equal or better substance and function.

Owner - The Department or Agency of the Municipality of Anchorage identified in page one (1) of the Contract. "Owner" does not include those Municipal employees, such as the Building Official and the Fire Marshal and their staffs, who enforce certain building, health and safety, and fire codes.

Owner's Representative – The person authorized to act on the Owner's behalf.

Performance and Payment Bond - The form of security, approved by the Municipality, that is furnished by the Contractor and the Contractor's Surety, guaranteeing the complete and faithful performance of all the obligations and conditions placed upon the Contractor by the Contract.

Product Data - Brochures, illustrations, diagrams, and other information prepared by the manufacturer and furnished by the Contractor to illustrate a material, product, or system for some portion of the Work.

Project - The total construction of which the Work performed under the Contract Documents may be the whole or a part.

Project Manual - The bound information that includes the bidding requirements, contract conditions, contract forms, and technical specifications.

Provide – To furnish, install, and/or to perform all work necessary to complete the Work.

Purchasing Officer - That person within the Municipality of Anchorage who is vested under the Anchorage Municipal Code with all authority pertaining to the procurement of supplies, services, and construction prior to execution of the Contract.

Request For Information (RFI) – A written document prepared by the Contractor to request information, clarification or deviation to the Contract Documents. Each RFI shall be numbered consecutively and a log maintained of submittals and responses.

Record Drawings – Detailed drawings that accurately depict all changes in location (both horizontal and vertical), material, equipment, and other elements of Work accomplished by the Contractor.

Samples - Physical examples that illustrate materials, equipment, or workmanship and establish standards by which the Work or a product will be judged.

Shop Drawings - All drawings, diagrams, illustrations, schedules, and other data that are prepared by the Contractor, a Subcontractor, a manufacturer, a supplier, or a distributor and which illustrate the equipment, material, or some portion of the Work.

Street Closure - Any action that renders one or more lanes of a street unusable to vehicular traffic.

Subcontractor - Any individual, firm, corporation, partnership or joint venture acting for or on behalf of the Contractor in the performance of a part of the Contract. This does not include those working for hire or suppliers of material or equipment.

Substantial Completion Date - The date upon which the improvements that are the subject matter of the Contract have been inspected and, in the opinion of the Owner's Representative, are essentially completed and available for the Owner's beneficial use for the purpose and in the manner intended by the Contract Documents, and all required testing and inspections have been satisfactorily completed.

Supplementary Conditions - That portion of the Project Manual entitled Supplementary Conditions that modify and expand the General Conditions and set forth conditions or requirements unique to the Project.

Surety - The Company or Association that is bound with and for the Contractor for the acceptable performance of the Contract and for the payment of all obligations arising out of the Contract. Regarding the Bid Guarantee, "Surety" refers to the Company or Association that will forfeit the sum of the Guarantee when the Bidder fails to execute the Contract after the Bid is accepted by the Municipality.

Technical Specifications - Divisions 1 through 49 of the Project Manual that define the qualitative requirements for products, materials, and workmanship.

Time and Material Work - Work performed by the Contractor at the written direction of the Owner's Representative for which no item is provided in the Contract and for which no unit price or lump sum basis can be agreed upon.

Unit Prices – A cost quoted by a bidder for a single, specified unit of work. Unit prices may be additive and/or deductive.

Utility Company - The person, corporation, company, agency, or other entity that furnishes service through, operates, or owns a conduit, pipe, wire, cable, or other transmission line for the purpose(s) of petroleum and petroleum products, electricity, sanitary sewer, communications, steam, water, natural gas, and storm sewer.

Winter Suspension - The period of time during which no fieldwork is accomplished due to adverse winter weather conditions as permitted by Article 5.25 – Suspension of Work

Work - Work shall mean the furnishing of all labor, materials, equipment, and other incidentals necessary or convenient for the successful completion of all the duties and obligations imposed by the contract.

Working Titles – Working titles that are adjectives or have masculine genders such as "workman" and "flagman" or are pronouns such as "he," "his," and "him" are used in the Contract Documents for the sake of brevity and are intended to refer to persons of either gender.

Written Notice - A written communication delivered in person to the individual or to a member of a firm, to an officer of a corporation, or to a representative of an agency for whom it is intended, or sent by mail to the business address stated in the Contract Documents.

SECTION 00 72 13.02 BIDDING REQUIREMENTS AND CONDITIONS

Article 2.1 Examination of Bidding Documents and Site

The Bidder shall examine carefully the site of the proposed Work and the Bidding Documents before submitting a Bid. By submitting a Bid, the Bidder acknowledges that the Bidder has made such examination and is satisfied as to the conditions to be encountered in performing the Work and as to the requirements of the Bidding Documents.

The Municipality assumes no responsibility for any understanding or representations concerning conditions made by any of its officers, agents, or employees prior to the execution of this Contract, unless such understanding or representations are expressly stated in the Bidding Documents or Addenda.

When soil boring data are provided by the Bidding Documents, the Bidder shall assume responsibility for any conclusions the Bidder may draw from such data. The bidder shall be responsible for obtaining and analyzing such additional data as the bidder may require and shall be responsible for conclusions drawn from that information.

By submitting a bid, the Contractor declares that the Contractor has carefully examined the contract documents, that the Contractor has full knowledge thereof, and that the Contractor has investigated the site and satisfied himself as to the conditions affecting the Work, including, but not limited to, those bearing upon transportation, disposal, handling, and storage of materials; availability of labor, water, electrical power, and roads uncertainties of weather; physical conditions at the site including all existing utilities, the conformation and conditions of the ground, and the character of equipment and facilities needed preliminary to and during prosecution of the Work. The Contractor further declares that the Contractor is satisfied as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all prior exploratory work, as well as from information presented by the drawings and specifications made a part of this contract. Any failure by the Contractor to acquaint himself with the available information will not relieve him from responsibility for properly estimating the difficulty or cost of successfully performing the Work.

The Bidder shall comply with the requirements of the Equal Opportunity Special Provisions as contained in the Bid and resulting Contract.

Article 2.2 Interpretation or Correction of Bidding Documents

Bidders shall notify the Purchasing Officer promptly of any error, omission, or inconsistency that they discover during examination of the Bidding Documents and the proposed construction site.

Bidders shall request interpretation or clarification of the Bidding Documents in writing to the Purchasing Officer. The Purchasing Officer will consider requests that arrive at least seven (7) working days prior to the date for opening Bids. The Contractor may present oral questions at a pre-bid conference if one is provided for in the Bidding Documents. The Purchasing Officer will issue interpretations, corrections, or changes, if any, to the Bidding Documents by Addendum. Bidders shall not rely upon interpretations, corrections, and changes made in any other manner, including orally, at the pre-bid conference. Interpretations, corrections, and changes shall not be binding unless included in an Addendum.

Article 2.3 Preparation and Submission of Bids

Bidders shall submit manually signed Bid Proposals on forms furnished and shall submit Bids in a sealed envelope addressed as indicated in the Invitation to Bid, plainly marked with the Invitation Number.

Bidders shall quote on all items, unless specifically allowed otherwise by the Invitation to Bid. Failure to do so will disqualify the Bid. When quotations on all items are not required, Bidders shall insert the words “no bid” in the space provided for any item where no quotation is made. The person signing the bid shall initial every erasure or change made to the Bid Proposal forms, if any.

Contractor shall provide a lump sum price, typed or written in ink, for each bid item called for. The bid shall be submitted in both words and figures. If there is a discrepancy between the written words and figures, the written words will govern. In case of error in the extension of prices, the price for each bid item will govern. The Purchasing Officer may reject Bids that show any omissions, alteration of the forms, additions not called for, conditional or alternate bids not called for, qualified bids, or irregularities of any kind.

Article 2.4 Bid Guarantee

Bidders shall accompany each Bid with a certified check, cashier’s check, or Bid Bond, in the amount of ten percent (10%) of the total amount of the Bid, if the total amount of the bid is $100,000 or more, with surety acceptable to the Municipality. If the total bid amount of the bid is less than $100,000, accompany the bid with a bid guarantee, in the form specified above, in an amount of $1,000. Bid Guarantees for the three (3) low Bidders will be held until the Contract is executed. All other Bid Guarantees will be returned within seven (7) days of the bid opening. Bidders shall submit Power-of-Attorney for the person signing the Bid Bond for the Surety.

SECTION 00 72 13.03 AWARD AND EXECUTION OF CONTRACT

Article 3.1 General

The provisions of Section 00700.03 are intended to be supplemental to, and not to replace, Title 7 of the Anchorage Municipal Code.

Article 3.2 Receipt and Opening of Bids

Submit bids to the Purchasing Officer or his designated representative at the Municipal Purchasing Department prior to the time of opening specified in the Invitation to Bid. The Purchasing Officer or his designated representative will record the exact date and time of receipt of Bids. The Purchasing Officer will not consider late Bids but will hold them unopened until the time of award and then return them to the Bidder unless other disposition is requested or agreed to by the Bidder. The Time of Bid receipt will be determined by the time stamp of the Municipal Purchasing Department.

The Purchasing Officer will not consider facsimile bids; however, he will consider facsimile modifications of bids already submitted in writing if the facsimiles are received prior to the time of bid opening fixed in the Invitation to Bid. Facsimile modifications shall not reveal the amount of the original or revised bid. Modifications shall state a plus or minus to the affected bid item.

No liability will attach to the Municipality for the premature opening of or the failure to open a Bid not properly addressed and identified.

The Contractor may withdraw bids by written request prior to the time specified for bid opening in the Invitation to Bid.

If any one party offers more than one Bid, by or in the name of his clerk, partner, or other person, the Purchasing Officer will reject all such Bids. A party who has quoted prices to a Bidder is not thereby disqualified from quoting prices to other Bidders or from submitting a Bid directly for the Work.

Article 3.3 Bidder Qualifications

The Purchasing Officer reserves the right to determine whether a Bidder is a responsible contractor. The Purchasing Officer may require the Bidder to submit such information as he may deem necessary to determine a bidder's responsibility. Failure or refusal on behalf of the Bidder to submit the required information, in whole or in part, may be grounds for the purchasing Officer to determine the Bidder as non-responsible.

The Purchasing Officer will determine whether a Bidder is responsible on the basis of any or all of the following criteria:

1. The skill and experience demonstrated by the Bidder in performing contracts of a similar nature;

2. The Bidder's record for honesty and integrity;

3. The Bidder's capacity to perform in terms of facilities, personnel, and financing;

4. The Bidder's past performance under Municipal contracts. If the Bidder has failed in any material way to perform his obligations under any contract with the Municipality, the Bidder may be determined as a non-responsible Bidder.

A Bidder's representations concerning his qualifications will be construed as a covenant under the Contract. Should it appear that the Bidder has made a material misrepresentation, the Owner will have the right to terminate the Contract for the Contractor's breach, and the Owner may then pursue such remedies as provided in the Contract Documents or as provided by law or equity.

Any determination that a Bidder is non-responsible will be made by the Purchasing Officer. The Purchasing Officer will make such determination in writing to the Bidder setting forth the reasons for such determination and the Bidder's right to request a review of this determination by the Bidding Review Board.

If a Contractor has had a contract terminated by the Owner for cause as provided in Article 5.29 – Termination of Contract by Owner, the Contractor may not be allowed to bid on the owner's future contracts for a period of two (2) years. This two- (2-) year period shall commence from the date of the termination of the Contractor by the Owner.

All bidders shall hold a valid Alaska Contractor’s license per Alaska Statute AS 08.18.

Article 3.4 Action on Bids

The Municipality reserves the right to reject any and all Bids and to waive any informalities and irregularities in a Bid or during award of the Contract.

The Municipality may reject any bid which is unbalanced if it is in the best interest of the Municipality to do so. A bid is unbalanced when, in the opinion of the Purchasing Officer, it allocates a disproportionate share of costs or profit, or both, to the price of one (1) or more items of Work and reduces the share of costs or profit, or both allocated to the price of another item or items of Work, and if there is a reasonable possibility that the bid will not result in the lowest overall cost of the Work to the Municipality.

Unless otherwise stated in the Bidding Documents, the Municipality will award the Contract, if any, to the responsible Bidder who submits the low responsive Bid. When the Bidding Documents contain a basic bid and alternates, the Purchasing Officer will use the total of the basic bid plus the alternatives he selects to determine the low Bidder.

When the Bidding Documents contain a basic bid and additive alternates, the Purchasing Officer will determine the low Bidder by the lowest combination of the basic bid and as many additive alternates as the Purchasing Officer selects within the funds available. The Purchasing Officer will select, in most cases, additive alternates in the order listed in the Bid. However, the Purchasing Officer may bypass any additive alternate whose selection would cause the Contract to exceed the funds available. The Purchasing Officer will compare all bids based upon the same combination of basic bid plus selected additive alternates.

When the Bidding Documents contain deductive alternates, the Purchasing Officer will determine the low Bidder by the lowest basic bid. If the lowest basic bid exceeds the funds available, the Purchasing Officer will determine the low Bidder by eliminating deductive alternates in the order listed in the Bid until the award can be made within the available funds. The Purchasing Officer may bypass any deductive alternate to maximize the use of available funds. The Purchasing Officer will compare all bids based upon the same combination of basic bids and selected deductive alternatives.

The amount of the Contract shall be the total sum of the amounts computed from the estimated quantities and unit prices and/or the lump sum awarded by the Purchasing Officer and specified on page one (1) of the Contract.

The Purchasing Officer will give a written, signed Notice of Award or rejection within forty-five (45) days of Bid opening. The notice will be in writing and signed by the Purchasing Officer. A Notice of Award, and no other act of the Municipality or its representatives, constitutes an acceptance of a Bid. The acceptance of a Bid shall bind the successful Bidder to execute the Contract.

Article 3.5 Bonds and Insurance

If the amount of the contract is $100,000 or more, the successful Bidder shall furnish the Purchasing Officer a Performance and Payment Bond in the full amount of the Contract and shall maintain the Bond in force during the continuance of this Contract including the one- (1-) year warranty period. For projects less than $100,000, the requirement for Performance and Payment Bond is deleted. The Bond shall be for the faithful performance of this Contract in all respects including, but not limited to, payments for all materials and labor. All alterations, extensions of time, additional Work and other changes authorized by the Contract Documents may be made without securing the consent of the Surety or Sureties. The bond shall be with a good and sufficient corporate surety acceptable to the Municipality and a Power-of-Attorney for the person signing the Bond for the Surety must be submitted with the Bond.

The successful Bidder shall furnish the Purchasing Officer with a certificate of insurance pursuant to the provisions of Article 6.9

The Bidder shall exercise positive efforts to comply with the Equal Employment Opportunity policies of the Municipality of Anchorage. The Bidder shall familiarize him/herself with the Equal Opportunity Special Provisions for Municipal Contracts, including submittal requirements for bids, prior to award and after award.

Article 3.6 Execution of Contract

The Bidder whose Bid is accepted shall execute the Contract and furnish the required bonding and insurance within five (5) working days after Notice of Award of the Contract is issued.

The Municipality will consider the Contract executed by the successful Bidder when two (2) copies of the Contract, signed by an authorized representative of the Contractor, and the required bond and insurance certificate are received by the Purchasing Officer. Failure or neglect of the Contractor to execute the Contract within the time specified may result in a forfeiture of the Bid Guarantee and award of the Contract to the next lowest Bidder.

The Owner will execute the Contract within ten (10) working days after execution by the Contractor as set forth above. The date the Contract is executed by the Owner is the Contract Date. The rights and obligations provided for in the Contract shall become effective and binding upon the parties as of the Contract Date.

The Municipality will supply the Contractor with four (4) sets of the Contract Documents. The Contractor may obtain any additional documents required from the Architect/Engineer by compensating the Owner for the cost of the printing.

The Municipality will issue the Notice to Proceed within seven (7) working days after the Contract Date unless otherwise specified in the Supplementary Conditions. The effective date of the Notice to Proceed shall be within ten (10) working days of the Contract Date. The Municipality will designate the Owner’s Representative, and calculate or identify the completion date in the Notice to Proceed.

Article 3.7 Contractor's Warranty

The Contractor shall warranty all materials and workmanship for one (1) year from the Final Acceptance Date except when a different period is identified in the Supplementary Conditions. Under this warranty, the Contractor shall promptly remedy, without cost to the Owner, any and all defects in material and workmanship, including any consequential damages resulting from defective materials or workmanship.

All warranty work shall be subject to the same contract provisions, including materials, quality of work, authority of the Owner's Representative and inspection, as provided for in the original work; however, all such work shall be at the sole cost of the Contractor. If the defect, in the opinion of the Owner's Representative, is of such nature as to demand immediate repair, the Owner has the right to take corrective action, and the Contractor shall bear the cost thereof. If the contract includes work in different geographic locations, then the Municipality may accept the work in one location and may begin the warranty period for that location independently of the completion of the work in the other locations.

SECTION 00 72 13.04 SCOPE OF WORK

Article 4.1 Intent of the Contract Documents

The intent of the Contract Documents is to provide for the execution and completion of the Work in its entirety. Except as otherwise specifically provided herein, the Contractor shall provide all permits, transportation, handling, materials storage, labor, tools, implements, machinery, supplies, water, heat, utilities, cleaning supplies and activities, and incidentals and shall do all things necessary to perform and to complete the Work.

When words that have a well-known technical or trade meaning are used to describe Work, materials, or equipment, such words shall be interpreted in accordance with that meaning.

Reference to Standard Specifications, manuals, or codes of any technical society, organization, or association, or to the Laws or Regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest Standard Specification, manual, code or Laws or Regulations in effect at the time of opening of Bids, except as may be otherwise specifically stated.

However, no provisions of any referenced Standard Specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the respective duties and responsibilities of the Owner, the contractor, or the Owner's Representative nor any of their consultants, agents, or employees from those set forth in the Contract documents.

With reference to the Drawings, the order of precedence is as follows:

1. Figures (numerals) govern over scaled dimensions.

2. Detailed Drawings govern over general Drawings or standard details.

Article 4.2 Interpretation of Contract, Specifications, and Drawings

The Contract Documents are intended to be complementary and to describe and provide for a complete description of the entire scope of Work. A requirement occurring in one section of the Contract Documents is as binding as though occurring in all.

In cases of conflict in the requirements of the Contract Documents, such conflicts shall be reconciled by the acceptance of the following order of precedence for the various Contract Documents: (1) the Contract; (2) the Bid Proposal; (3) Supplementary Conditions; (4) the Technical Specifications (Division 1 through Division 16); (5) the Drawings; (6) the General Conditions (Section 00700); and (7) standards incorporated by reference in any of the above.

Where the Technical Specifications and Drawings are silent or lack detail, the Contractor shall use the best general practice and approved material and workmanship of first quality.

The Contractor shall carefully study and compare the Contract Documents and shall at once report to the Owner's Representative any error, inconsistency, or omission he may discover, including any requirement that may be contrary to any law, ordinance, rule, regulation, or order of any public authority bearing on the performance of the Work.

The Contractor shall take no advantage of any errors or omissions in the Contract Documents or of any discrepancies within them. Contractor shall assume all risk and expense when knowingly performing Work where such error or omission is not called to the attention of the Owner's Representative.

The Contractor shall accompany all requests for interpretation or clarification of the Contract documents with a completed Request For Information (RFI) form. Each request shall clearly and completely state the basis for lack of clarity in the Contract documents and shall refer to the applicable specifications, drawings, and details that give rise to the request. If not provided in the Contracts Documents, the Contractor shall obtain a copy of the RFI form from the Owner's Representative. The Owner's Representative will respond to the RFI in writing within ten (10) working days.

Article 4.3 Changed Conditions

The Contractor shall promptly, within two (2) working days and before such conditions are disturbed, notify the Owner's Representative in writing of: (1) subsurface conditions or otherwise concealed conditions at the site differing materially from those indicated in this contract, or (2) unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this contract. The Owner's Representative will promptly investigate the conditions, and if he finds that such conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performance of this contract, the Municipality will make an equitable adjustment and modify the contract in writing accordingly.

The Owner's Representative will not allow a claim under this clause unless the Contractor has given the notice required above. However, the Owner's Representative may extend the time prescribed for completion of Work. Reference Article 5.21 – Changes in the Work.

The Contractor shall not submit a claim for an equitable adjustment hereunder after the date of final payment under this contract.

If the parties are unable to agree on the terms of an equitable adjustment, the Owner's Representative may order such work done and pay for such work as provided in Article 5.21 – Changes in the Work and allow such additional time for performance as he may deem proper. If the Contractor does not agree with such adjustments, he may make claim under Article 5.22, Claims for Additional Compensation.

Article 4.4 Temporary Utilities

The Contractor shall provide and pay all costs for temporary utilities, including gas, water, sanitary sewer, telephone, and electricity, necessary to perform the Work. The Contractor shall pay for these costs during periods of suspensions of work. The Owner does not represent that utility service is available to the site.

The Contractor shall provide temporary heat, including fuel and power, as required to protect materials and Work from the elements. The Contractor shall provide and maintain temporary toilets and shall provide drinking water for all those connected with the Work.

Article 4.5 Surveying

Before starting Work, the Contractor shall locate all general reference points and take such steps as are necessary to prevent their dislocation. If disturbed, the Contractor shall replace reference points as directed by the Owner's Representative. The Contractor shall employ a competent Land Surveyor, licensed in the State of Alaska, to lay out the Work, and shall be responsible for its accuracy.

Article 4.6 Disposal Sites

Except as otherwise stated in the Supplementary Conditions, the Contractor shall make his own arrangements and assume all costs in connection with disposal sites. The Contractor shall furnish a disposal site for trees, brush, outsized boulders, and other objectionable debris. The Contractor shall dispose of unusable excavation at either the Anchorage Regional Landfill off Hiland Road or at a Contractor-furnished disposal site. Unusable excavation or any material containing stumps, brush, or other construction debris will be charged at the current disposal fee at the Anchorage Regional Landfill. The Contractor shall obtain and comply with a grading and fill permit for each disposal site he furnishes, in conformance with the most current International Building Code (IBC), as adopted and amended by the Municipality of Anchorage. Contractor shall locate and maintain the disposal site in such a manner as to prevent a public nuisance.

The Contractor shall obtain written permission from the property owner(s) for such disposal sites and shall furnish the Owner's Representative with a copy of this permission and a Municipal Grading and Fill Permit. The written permission shall specifically provide that the property owner will not hold the Municipality, its employees, agents, or consultants liable for use of or damage to this property. The Contractor shall be held liable for any trespass and property damage incurred outside of the disposal site.

Waste Disposal. Prior to construction, the Contractor shall submit a description of his scheme for disposing of unsuitable materials and waste resulting from the Work under this Contract. If any material is disposed of in unauthorized areas, the Contractor shall remove the material and restore the area to the condition of the adjacent undisturbed areas.

Article 4.7 Protection of Persons and Property

The Contractor shall be responsible for initiating, supervising, and maintaining of all safety programs and precautions in a manner to prevent damage, injury, or loss to the Work employees, the public, and property. These safety requirements are applicable to the Work whether on-site or off the site for Work under the control, custody, or care of the Contractor. These responsibilities include adjacent sites and their improvements including landscaping, walks, roadways, structures, and utilities. If the Contractor encounters material on the site that may be reasonably identified as asbestos-containing material (ACM), polychlorinated biphenyl (PCB), or other hazardous materials not requiring abatement as part of the Work, the Contractor shall stop the Work immediately in the affected area and notify the Owner's Representative and Owner in writing. The Work shall not be resumed in the affected area until a final determination has been made by the Owner's Representative on the status of the material in question.

The Contractor shall be solely and continuously responsible, twenty-four (24) hours per day, seven (7) days per week, until contract completion for the safety measures outlined above and the following:

(a) Erecting and maintaining, as required by existing conditions and progress of work, all safeguards for safety and protection, including barricades, danger signs, traffic control devices, and other warnings against hazards.

(b) Providing reasonable access at all times for emergency units such as the Anchorage Police Department, the Anchorage Fire Department, and the Anchorage Fire Department's Hazardous Materials Response Team.

During periods of suspension of work, refer to Article 5.25 – Suspension of Work, for areas of responsibilities.

Protection of Water Resources. The Contractor shall control the disposal of fuels, oils, bitumens, calcium chloride, acid, or harmful materials, both on and off the premises, and shall comply with applicable federal, state, and municipal laws concerning pollution of waterways while performing Work under this Contract. Special measures shall be taken

to prevent chemicals, fuels, oils, greases, bituminous materials, and sewage from entering established drainages.

Article 4.8 Public Convenience and Access

The Contractor shall conduct the Work in such a manner as to cause minimum inconvenience to pedestrians and vehicular traffic and to persons conducting commercial enterprises or residing along the route of Work. The Contractor shall not block entrances or driveways for more than three (3) hours without prior approval of the Owner's Representative. The Contractor shall provide and maintain temporary pedestrian bridges, ramps, or culverts at entrances of adequate width and strength for the service required. All work involved in providing for construction, maintenance, and use of entrances and driveways is the responsibility of the Contractor and will not be paid for separately and will be considered incidental to the lump sum and prices contained in the Contract Documents. It is the Contractor's responsibility to provide adjacent property owners and/or tenants with written notification of closure of access and to provide an Owner's Representative-approved alternative access at all times for the property owners, the tenants, and the public no less than forty-eight (48) hours prior to closure.

The Contractor shall be responsible for maintaining access at all times for emergency vehicles.

The Contractor shall, prior to the commencement of Work, submit any written agreements between the Contractor and property owners regarding access and use of private property within the project limits for any purposes associated with this Project. Any such agreements shall indemnify the Municipality from any and all actions that result from activities of the Contractor

If the Work of the Contractor is delayed because of any construction activities or transportation activities related to nearby construction, whether municipal or private projects and regardless of whether the activities were authorized by the Owner, the Contractor is not entitled to additional compensation from the Owner but will be entitled to an extension of time to the extent that such delay is unavoidable through reasonable efforts on the Contractor's part. Except as to a possible entitlement to such an extension of time, the Contractor shall hold harmless, defend, and indemnify the Owner from and against any and all claims, damages, losses, and expenses, including attorneys' fees, by the Contractor or third parties, arising directly or otherwise out of the construction and/or transportation activities as indicated above.

Article 4.9 Street Closures

The Contractor shall conduct construction operations so as to offer the least interference to vehicular traffic. Provide vehicular access to emergency units to and through all work areas at all times. Do not close two (2) adjacent parallel streets at the same time.

The Contractor shall submit requests for all street closures or partial closures to the Owner's Representative and the Municipal Permit Office and will not commence closures

or partial closures until the Owner's Representative and the Permit Office issue approvals.

In the case of arterial street closures, do not commence street closures or partial street closures until after giving forty-eight- (48-) hours advanced notice to the public.

Prepare and submit four (4) copies of an acceptable Traffic Control Plan (TCP) to be employed during construction. Deliver the TCP to the Owner's Representative within ten (10) days of the effective date of the Notice to Proceed, or five (5) working days before commencement of Work, whichever is the earlier date. The Owner's Representative will review and accept or reject the plan within five (5) working days of submission. Successive submittals will also be reviewed within five (5) working days.

The TCP shall conform to the standards in the latest edition of the Municipality of Anchorage Standard Specifications (MASS), Part VI of the Manual of Uniform Traffic Control Devices (MUTCD), and shall also conform to the requirements in the latest edition and supplements of the Alaska Traffic Manual (ATM). When conflict exists between MASS and the ATM, the requirements of MASS and these General Conditions shall govern.

Article 4.10 Maintenance and Drainage

The Contractor will maintain all detour routes, haul routes, streets under construction, ditches, water courses, existing drainage patterns, siltation controls, gutters, sidewalks, walkways, and bike trails affected by the Work until the Final Acceptance Date. This includes but is not limited to shaping, grading, and dust control. The Contractor will maintain existing drainage patterns disturbed as a result of construction, including reestablishment of drainage ditches, swales and gutter flow lines to their preconstruction condition, grade, and elevation.

When cleaning paved streets, curb and gutters, and alleys and sidewalks, the Contractor shall not flush the streets using only water but shall use such methods as established by the Director of Health and Human Services for sweeping operations. The Contractor shall prevent any spillage from entering any storm drains.

The Contractor shall restore all streets, drainage ditches, swales, water courses, gutters, sidewalks, walkways, and bike trails used by the Contractor or interrupted by his Work to their preexisting condition. The Contractor shall construct and maintain any drainage and siltation control necessary to accommodate water released by pumping or dewatering operations and contain the water to prevent inconvenience to pedestrian and vehicular traffic.

The Contractor shall repair or replace any culverts, swales, catch basins, or storm drains damaged during construction at no expense to the owner.

Upon receipt of the building permit, the Contractor shall prepare and implement an Erosion and Sediment Control Plan on the construction site prior to starting construction and maintain it throughout the construction period. The Erosion and Sediment Control Plan shall be readily accessible on site.

All costs associated with maintenance of drainage patterns and repair or replacement of drainage ditches, swales, catch basins, storm drains, gutter flow lines, and any other drainage appurtenances are incidental to the Contract or to the item under construction, and no separate payment will be made.

Dust and Mud Control

a. The Contractor shall maintain all excavations, embankments, stockpiles, access roads, waste areas, borrow areas, and all other work areas free from excess dust and mud to such reasonable degree as to avoid causing a hazard or nuisance to others.

b. All existing paved areas and roadways, especially heavily traveled roads, adjacent to the project construction site or used as haul roads, shall be kept clean of dirt, mud, and debris resulting from the Contractor's operation during the construction period.

Article 4.11 Utilities

Whenever the Contract Documents require permanent connections to be made to utility lines, the Contractor shall, unless otherwise specified in the Supplementary Conditions, be responsible for making the connection to the utility line at the point(s) indicated on the Drawings, including making all necessary applications with the Utility Company, for paying the fees and for performing the work associated with making the connections indicated. The Contractor is not responsible for bringing utility lines to the point of connection. The Contractor shall pay all costs for utility service prior to the date of Substantial Completion.

Locations of utilities shown on the Drawings are not exact. Aboveground utilities have been field-located. Belowground utilities are shown as depicted on record documents prepared by others. The Contractor shall not hold the Owner liable for damages to utilities incurred during construction due to deficiencies or omissions on the Drawings or these provisions. At least forty-eight (48) hours prior to commencing work, the Contractor shall contact all local utility companies to obtain underground utility locates and shall exercise due care to prevent damage to utilities. Should a utility be damaged, the Contractor shall immediately notify the utility company and have the damage repaired, at no cost to the Owner. The utility has the right to do work or have its contractor do work in connection with making repairs to the utility lines damaged by the Contractor. If any Utility Company determines that a utility has to be temporarily raised, lowered, moved, guyed,

shored, braced, or otherwise protected during construction, the Contractor shall do so at his own expense and to the satisfaction of the utility company.

The Contractor shall maintain all utility service connections whether marked on the Drawings or not. In addition, the Contractor shall repair or replace all utility service connections (at his own cost) that are damaged by his actions.

At a sufficient distance, prior to encountering a known obstacle or tie-in to an existing conduit, pipe, or manhole, the Contractor shall expose and verify the exact location of the obstacle, pipe, or manhole so that proper alignment and/or grade may be determined before the pipe sections are laid in the trench and backfilled. The Contractor shall notify the Owner's Representative of the results of this verification prior to commencement of the Work affected by results of verification, so that any modification to the contract drawings or supplementary instructions may be supplied by the Owner's Representative. The Contractor shall allow the Owner's Representative one complete working day to review the verification results and provide any design modifications or supplementary instructions necessary. No additional payment will be made for this Work.

The Contractor shall bear all costs incurred for removal and alignment of backfilled pipe sections due to improper verification methods.

Unless otherwise specified in the Supplementary Conditions, it is the intent of the Contract Documents that utilities will not be relocated to facilitate construction. If the Owner's Representative determines that an existing utility must be relocated because it is in direct conflict with the facility being constructed, the existing utility will be relocated by the Utility Company at no charge to the Contractor.

The Contractor shall be responsible for coordinating the Work with any work of a Utility Company and shall not interfere with the initial installation, relocation, reconstruction, or replacement of any utility including the making of necessary service connections by the utility company. If the Work of the Contractor is delayed because of any acts or omissions of the utility company, the Contractor will not be entitled to additional compensation from the owner but may be entitled to an extension of time.

Article 4.12 Utility Connections

Whenever the Contract Documents require permanent connections to be made to utility lines, the Contractor shall, unless otherwise specified in the Supplementary Conditions, make the connection to the utility line, or have the Utility Company make the connection, at the point(s) indicated on the Drawings. The Contractor shall make all necessary applications to the Utility Company and pay all fees and perform all Work associated with making the connections that is not performed by the Utility Company. The Contractor is not responsible for bringing utility lines to the point of connection. The Contractor shall pay all costs for utility service prior to the Date of Substantial Completion.

Article 4.13 As-Built Documentation

The Contractor shall maintain As-Built Documents on the job site consisting of a complete set of Drawings and the Project Manual on which all changes of material, equipment, dimensions, or other changes in the Work shall be recorded (i.e., “marked up”) and kept current on a daily basis and shall be made available to the Owner’s Representative at all times. This shall include the following:

1. Placing special emphasis on items of the Work that have been or will be concealed and showing substitutions for items specified or shown, and including all approved changes.

2. Requiring Subcontractors, including mechanical and electrical, to keep their portions up to date and correct.

3. Dimensioning all relocations and routing adequately to ensure easy access for maintenance or remodeling.

Upon completion of the marked-up As-Built Documents, the Architect/Engineer will furnish to the Contractor a CD of the drawings along with a complete full size paper set. The Contractor shall only employ personnel for this task who are proficient in the preparation of architectural or engineering drawings.

All additions and corrections shall be neat, clean, and legible and shall match the adjacent existing line work and lettering annotated in type, density, size, and style. If additional drawings are required, the Contractor shall prepare them upon the same size as the original Drawings. Drawings damaged or lost by the Contractor shall be satisfactorily replaced by the Contractor at his expense.

The Architect/Engineer will review all Record Documents for completeness and conformance to the standards stated above. The Contractor shall make all corrections, changes, additions, and deletions required to conform to the standards. The Architect/Engineer may periodically review the status of the Record Documents during the course of the Work. Failure of the Contractor to keep the Record Documents current and in the required condition will be considered cause for additional withholding from the progress payments as provided in MASS Section 00700.07 Measurement and Payment, Article 7.4 Progress Payments

Approved final As-Built Documents, bearing certification of their correctness, shall be delivered to the Owner’s Representative prior to the pre-final inspection. The Certificate of Completion shall not be issued until after receipt of final As-Built Documents. All Work associated with the development, preparation, and presentation of all Record Documents shall be incidental to the improvements being constructed, and no separate payment will be made.

Article 4.14 Operations and Maintenance (O&M) Manuals

The Contractor shall provide to the Owner's Representative thirty (30) days prior to the Substantial Completion date three (3) sets of Operations and Maintenance (O&M) manuals and one CD of the scanned O&M for all items of material and equipment as required by the Technical Specifications. The manuals shall be bound in hardcover binders with removable pages. The manuals shall be prepared in three (3) sets: Architectural, Mechanical Equipment, and Electrical Equipment. In addition to the requirements in the Technical Specifications, the manuals shall each contain an Index, by Specification Section; a key plan that graphically locates items of equipment; a list of contractors and subcontractors with addresses and telephone numbers; and a list of local representatives with addresses and telephone numbers.

1. The Contractor shall assemble all copies of the manuals in three-ring, hardcover binders. The Contractor shall be responsible for the following: Clearly label each binder on the cover and the end of the binder to designate the system or equipment for which it is intended with reference to the building and equipment number and the Specification Section where the equipment information is provided. Include the date of completion of the project.

2. Provide each binder with title page, typed table of contents with page numbers, and heavy section dividers with numbered plastic index tabs.

3. Divide each manual into sections paralleling the equipment specifications.

4. Where more than one binder is required, they shall be labeled "Vol. 1," "Vol. 2," and so on. Place the table of contents for the entire set, identified by volume number, in each binder.

5. Submit the manual organization and format to Owner's Representative for approval prior to manual preparation.

6. Hole punch all data for binding and composition and shall arrange printing so that punching holes does not obliterate data.

7. When standard technical data are provided, edit and delete all non-relevant information that is not applicable to the specific equipment or material provided.

8. Material in manuals shall be suitable for photographic reproduction. Where copies of identical material are included, the clarity and quality of copies shall equal the original.

Contents: Each manual shall be complete in all respects regarding equipment, controls, accessories, and associated appurtenances, and shall include the following:

1. Diagrams and illustrations.
2. A detailed description of the function of each principal component of the system.
3. Performance and nameplate data.
4. Installation instructions.
5. Procedure for starting.
6. Proper adjustment information.
7. Test procedures and results of factory tests where required.
8. Procedure for operating.
9. Shutdown instructions for both short and extended durations.
10. Emergency operating instructions and troubleshooting guide.
11. Safety precautions.
12. Maintenance and overhaul instructions, illustrated with detailed assembly drawings showing each part with part numbers and sequentially numbered parts list. Include instructions for ordering spare parts, and complete preventive maintenance and overhaul instructions required to ensure satisfactory performance and longevity of the equipment.
13. Lubrication instructions and diagrams showing point to be greased or oiled; recommend type, grade, and temperature range of lubricants; and frequency of lubrication.
14. List of electrical relay settings and control and alarm contact settings.
15. Electrical interconnection wiring diagram for equipment furnished, including all control and lighting systems.
16. Referral to individual Specification Sections for additional O&M requirements.

Article 4.15 Temporary Erosion Control During Construction

The Contractor shall provide all temporary erosion control measures necessary during construction for the prevention of water pollution, erosion, and/or siltation. These measures are for the protection of all streams, lakes, ponds, wetlands, and tidal waters.

The Contractor is directed to Alaska State regulation 18 Alaska Administrative Code [ACC] 70, which states that no person may conduct an operation that causes or contributes to a violation of water quality standards set forth in 19AAC70.010 through 18ACC70.032.

Unless a temporary erosion control plan during construction is specifically called out and included in the drawings and other contract documents, the Contractor shall provide a plan describing temporary erosion control measures to be employed during construction.

Deliver the plan to the Owner's Representative within ten (10) days of the effective date of the Notice to Proceed or five (5) days before the commencement of Work, whichever is the earlier date. The Owner's Representative will review and accept or reject the plan within five (5) working days of submission, and will review successive submittals within five (5) working days. The Contractor shall install the approved temporary erosion control measures immediately after mobilization and before commencing excavation.

Temporary erosion control measures include such items as silt fences, sedimentation ponds, intercepting embankments and channels, check dams, rock lining, mulching, jute matting, seeding, sodding, and other erosion control devices as required. Where erosion is expected to be a severe problem, the Contractor shall schedule and perform clearing, grubbing, grading, filling, and other operations such that permanent erosion control measures follow immediately.

Permanent erosion control measures are those work items specified elsewhere in the Contract Documents that are intended to provide permanent erosion control such as paving, seeding and other measures as required.

Temporary erosion control measures shall remain in place and in good working condition until Work is complete under the Contract. The Contractor is responsible for the continued maintenance of these temporary erosion control items and replacement of damaged items. The Owner's Representative may suspend Work if the Contractor fails to carry out the requirements of the temporary erosion control plan. After suspension of the Work, the Owner may perform or contract the performance of the erosion control measures and deduct those costs from the Contractor's progress payments.

Payment for this Work is incidental to the Contract, and no separate payments will be made.

SECTION 00 72 13.05 CONTROL OF WORK

Article 5.1 Authority of the Owner's Representative

The Owner's Representative will observe the Work in progress on behalf of the Owner, and will be identified at the time the Notice to Proceed is issued. The Owner's Representative is not responsible for construction means, methods, techniques, sequences, or procedures or for safety precautions and programs in connection with the Work. Visits and observations made by the Owner's Representative will not relieve the Contractor of his obligation to conduct comprehensive inspections of the Work, to furnish materials, to perform acceptable Work, and to provide adequate safety precautions, in conformance with the intent of the Contract. The Work will not be considered completed until a Certificate of Completion is issued by the Owner's Representative. The Contractor shall at all times carry out and fulfill the written instructions and written directions of the Owner's Representative regarding the Contract Documents.

The Owner's Representative has the authority to order changes in the Work requiring an adjustment in the Contract amount and/or time. However, any change in the Work shall be in accordance with Article 5.21 – Changes in the Work. Any single change in the Work, or cumulative changes in the Work, which will cause the total value of the Contract to exceed the limits stated in AMC 7.15.080 requires Assembly approval.

The Owner's Representative will in all cases make determinations on any and all questions that may arise concerning the quality, quantity, and acceptability of materials furnished, the Work performed, the rate of progress of the Work, and the interpretation of Contract Documents.

If the Contractor determines that instructions, clarifications, or directions issued by the Owner's Representative constitute a change in the requirements of the Contract Documents, he may make claim as provided under Article 5.22 - Claims for Additional Compensation.

Article 5.2 Prosecution of the Work

The Contractor shall not commence Work until a written Notice to Proceed has been received by the Contractor. He shall commence the Work within ten (10) days after the effective date specified in the Notice to Proceed and shall prosecute the Work vigorously and continuously.

Article 5.3 Construction Progress Schedule and Schedule of Values

Within ten (10) days after the effective date of the Notice to Proceed and prior to commencement of the Work, the Contractor shall submit, to the Owner's Representative a Construction Progress Schedule in the form of a time-scaled bar chart, the elements of which shall be the Divisions and Sections of the Project Manual, weather and ground condition restraints, and Work suspensions and other significant influences on the Contract amount and/or the time for completion of the Work. The Contractor shall include other significant features of the Work such as the submittal schedule, permit acquisition plan, material procurement milestones, plant and equipment procurement dates, and shipping schedules. The bar chart shall include a graph representing the monthly percent of Work to be completed. The bar chart shall be revised and resubmitted as required by the Owner's Representative, when conditions cause changes to the construction schedule, or on a monthly basis, whichever is sooner.

When required by the Owner's Representative, the Contractor shall also deliver, at the same time the Construction Progress Schedule is delivered and in a form satisfactory to the Owner's Representative, a Schedule of Values for Contract Payments for those lump sum items designated by the Owner's Representative. The Contractor shall submit monthly partial Payment Estimates based on the Schedule of Values. All Schedules of Values and Payment Estimates shall, as a minimum, be organized to be consistent with the Divisions and Sections of the Project Manual. The Owner's Representative may require submission of revised construction schedules demonstrating the manner in which the Contractor will achieve the necessary rate of progress, all without additional cost to

the Owner. Partial Payment Estimates may be appropriately reduced if the Owner's Representative determines that the Contractor has failed to supply the Owner with the requested or necessary information.

In addition to the time-scaled bar chart described above, and when specified in the Supplementary Conditions**,** the Contractor shall develop and submit to the Owner's Representative for approval a time-scaled Critical Path Method (CPM) schedule. Both a hard copy and electronic copy of the CPM schedule shall be submitted. The Contractor shall revise and resubmit the CPM schedule to reflect any alteration in the sequence of scheduled activities or of the critical path with each partial payment request and at such other times as the Owner's Representative may require, and at any time the Contractor determines that the critical path is altered by changes or other circumstances. The Contractor shall submit the initial CPM schedule to the Owner's Representative no later than twenty-one (21) days from the effective date of the Notice to Proceed and at least monthly thereafter.

The Contractor shall organize the scheduled activities to be consistent with those Specifications Divisions and Sections required for the Work. Each Division and Section of the Specifications and each item in the Schedule of Values shall be represented by one or more scheduled activities. In addition, one or more scheduled activities shall be used to represent the submittal schedule, permit acquisition, materials procurement, plant and equipment procurement, shipping, and all other significant elements of the Work. The Contractor shall include activities that address weather and ground condition restraints, critical dates, holidays, periods of Work suspension, and all other restraints (i.e., all events that are critical or will become critical to the schedule).

All schedules, whether they are bar chart schedules or CPM schedules, shall include enough detail to adequately describe all important activities necessary to complete the Work. Unless otherwise agreed to by the Owner's Representative, no single activity in any schedule will be allowed to represent more than $50,000 of the total scope of the Work. Providing the initial schedule and monthly schedule updates shall be considered a payable activity and appropriate payment amounts shall be included in the Schedule of Values. Failure to provide adequate schedules will result in non-payment in accordance with the amounts established in the Schedule of Values.

Article 5.4 Unusual Working Hours, Holidays, Saturdays, and Sundays

The Contractor shall give the Owner's Representative forty-eight (48) hours advance notice of his intention to work overtime, Saturdays, nights, Sundays, holidays, or anytime outside the usual working hours. In no case shall the Contractor do any such Work without first notifying the Owner's Representative to allow arrangements for proper inspection. Unless of an emergency nature, the Owner will not pay for work performed in violation of this paragraph.

The Contractor shall reimburse the Owner all costs for inspection work performed on Sundays or recognized holidays except when this work is required by a permit issued by an agency after the contract has been executed.

Article 5.5 Shop Drawings

The Contractor shall submit for review to the Owner's Representative six (6) copies of those Shop Drawings required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the work of the Owner or any separate contractor.

The Shop Drawings submitted by the Contractor shall bear his specific written and signed certification that he has verified that the Work shown is in conformance with the contract documents; that he has determined and verified quantities, dimensions, field measurements, and related field construction criteria; and has checked and coordinated the submittal with the requirements of the Work. The Contractor shall indicate on the Shop Drawing submittal any deviation from the requirements of the Contract Documents.

All Shop Drawings shall be clear and legible. Any Drawings submitted that appear to be carelessly prepared, erroneous, or unchecked will be returned to the Contractor for further action and resubmittal.

The Owner's Representative shall submit the Shop Drawings to the Architect/Engineer. With reasonable promptness, the Architect/Engineer will review and approve or take other appropriate action on the submittals, but only for conformance with the design concept of the Work and with the information given in the Contract Documents. The Architect/Engineer's approval of a specific item will not indicate approval of an assembly of which the item is a component.

The Architect/Engineer will state the reasons for rejection and/or resubmittal requirements if applicable.

The Contractor shall specifically note if revisions on resubmittals are other than those requested by the Architect/Engineer on previous submittals.

The Architect/Engineer, upon his approval, will return two copies of the Shop Drawings to the Contractor. If the Contractor requires more than two (2) copies, he shall submit such additional copies.

The Architect/Engineer's approval of Shop Drawings does not relieve the Contractor of responsibility for any deviation from the Contract Documents unless the Contractor has informed the Architect/Engineer in writing of the specific deviation and the Architect/Engineer has approved the specific deviation in writing. Errors and omissions that may occur in the Shop Drawings are the responsibility of the Contractor. The Contractor is not relieved of this responsibility by the Architect/Engineer's approval of the Shop Drawings.

When Shop Drawings are required on a portion of the Work, the Contractor shall not commence that portion of Work or any item relying on said portion of Work until the Architect/Engineer gives written approval of the Shop Drawings.

The Contractor shall keep one copy of all Contract Documents, including modifications, and one copy of approved Shop Drawings in good order and available to the Architect/Engineer or his representative at the construction site.

Article 5.6 Product Data

The Contractor shall submit for approval six (6) copies of complete Product Data for those items for which submittals are required by the Contract Documents including, but not limited to: specific performance data, material description, rating, capacity, working pressure, material gauge or thickness, brand name, catalog number, and operations and maintenance data. The Contractor shall submit such submittals with reasonable promptness and in such sequence as to not cause a delay in the Work, in the Work of the Owner, or any separate Contractor. With reasonable promptness, the Architect/Engineer will review and approve or take other action on the submittals. The Contractor shall not order equipment before receiving approval by the Architect/Engineer.

Product Data for equipment approved by the Architect/Engineer shall not in any case supersede the Contract Documents. The approval by the Architect/Engineer shall not relieve the Contractor from responsibility to correct deviations from Drawings or Specifications, unless he has in writing called the Architect/Engineer's attention to such deviations at the time of submission and secured the Architect/Engineer's written approval, nor shall it relieve him from responsibility to correct errors of any sort in the items submitted. The Contractor shall check and approve the item described by the Product Data with the Contract Documents for deviations and errors prior to submittal to the Architect/Engineer for approval. It shall be the responsibility of the Contractor to ensure that items to be furnished fit the space available as shown in the Contract Documents.

Upon approval of the equipment by the Architect/Engineer, the Contractor shall furnish four (4) copies of Product Data of all equipment or components together with operations and maintenance instructions.

Article 5.7 Submittal List

The Contractor shall complete, submit, and/or comply with all requirements as indicated in the Submittal List located in the bidding documents. The Contractor is hereby advised that the Submittal List is not an all-inclusive document. The Submittal List does not relieve the Contractor from his obligation to comply with all submittals, certifications, or other requirements as specified in these specifications or in the plans. The Contractor is responsible for determining that all submittals, certifications, and/or requirements are met, whether or not specifically addressed in the Submittal List.

Article 5.8 Materials

All materials and equipment furnished under the Contract shall be new unless otherwise specified and shall be of good quality, shall be free from defects, and shall conform to the requirements of the Contract Documents. Substitute materials shall not be used unless

approved by the Owner's Representative prior to installation. When required by the Owner's Representative, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

In order to establish standards of quality, the Technical Specifications may refer to certain products by name and catalog number. This does not eliminate from competition other products of equal or better quality by other manufacturers. The words "approved equal" are implied regardless of whether or not they appear.

The Contractor shall furnish the Owner's Representative with the list of proposed substitutions within ten (10) calendar days of the effective date of the Notice to Proceed (or such time as may be approved by the Owner's Representative), together with complete engineering and catalog data in sufficient time prior to their use to give the Owner's Representative adequate time for review. Failure on the part of the Contractor to obtain the necessary approval prior to ordering or using such alternate material or equipment shall not relieve the Contractor of furnishing acceptable material or equipment as required by the Contract Documents.

When the Owner's Representative judges the proposed substitute material or items of equipment to be unacceptable, the Contractor shall abide by the Owner's Representative's decision and shall furnish the specified material or item of equipment. The Owner's Representative will approve or disapprove proposed substitutions in writing within a reasonable time.

The Contractor shall store materials in such a manner as to ensure the preservation of their quality and fitness for use. When considered necessary to protect materials against cold or dampness, or to keep them clean and free from dust, dirt, or other detrimental matter, suitable sheds, platforms, and covers will be used that provide easy access to stored materials for inspection whenever access is requested by the Owner's Representative.

The Contractor shall apply, install, connect, erect, use, clean, and condition manufactured articles, material, and equipment as directed by the Manufacturer. In the event of conflict between the manufacturer's directions and the Contract Documents, the higher standard requirements shall govern.

Article 5.9 Testing of Materials

The Contractor shall conduct all tests in accordance with methods as described and designated in the Contract Documents. The Owner shall provide and pay for tests of materials that are required on site, unless otherwise specified in the Supplementary Conditions. The Contractor shall provide and pay for all factory testing, mill testing, and other off-site testing as specified or required to conform to codes and industry standards.

The Contractor shall provide such labor and facilities as may be required for collecting and forwarding samples to the local testing laboratory necessary for testing and shall hold the materials represented by the samples until tests have been made and the materials found equal to the requirements of the Specifications. The Contractor in all cases shall furnish the required samples without charge.

The Owner's Representative may periodically require repetitive testing of materials in constant use. The Contractor shall pay for retesting when materials have previously been tested and have not met the requirements of the Contract Documents.

In the absence of any definite Specification, materials and tests shall meet the specifications and requirements of the American Society for Testing and Materials (ASTM) and the American Association of State Highway Transportation Officials (AASHTO).

Wherever a particular ASTM or AASHTO specification is referred to by number, such reference shall include all amendments and additions thereto adopted by the ASTM or AASHTO prior to the award of the Contract.

Repetitive testing of materials in constant use may be required periodically by the Owner's Representative. Required retesting shall be accomplished at the expense of the Contractor when materials have previously been tested and have not met the requirements of the Contract Documents.

Article 5.10 Contractor's Authorized Representatives and Employees

The Contractor shall, within five (5) days after the Notice to Proceed, in writing, name the Superintendent, and file with the Owner's Representative a list of all persons who are authorized to sign documents on behalf of the Contractor to fully bind the firm.

The Superintendent shall be thoroughly qualified and experienced, shall be completely familiar with the requirements of the Contract Documents, shall direct all Work, and shall be present at the project site or readily available at all times while Work is in progress.

The Contractor shall employ only qualified journeymen, mechanics, operators, tradesmen, and installers who are thoroughly skilled and experienced in their respective trades or specialties. When apprentices and helpers are employed, they shall be under the supervision of qualified journeymen mechanics and tradesmen at all times.

The Contractor shall at all times enforce strict discipline and good order among his employees and Subcontractors and shall not employ on the Work any unfit person or anyone not skilled in the task assigned to him. The Owner's Representative may require the Contractor to remove from the Work any employee or Subcontractor that the Owner's Representative deems incompetent, careless, or otherwise objectionable.

Article 5.11 Subcontracting

If any part of the Work to be done under the Contract is subcontracted, the subcontracting shall be done in accordance with the following provisions:

The Contractor shall provide the Owner's Representative, in writing, a list of Subcontractors within 10 days of Notice to Proceed and prior to subcontractor working on site, together with a summary of the extent and character of the Work each Subcontractor shall do. If, for sufficient reason, at any time before or during the progress of the Work, the Owner's Representative determines that any Subcontractor is incompetent or undesirable, he will notify the Contractor accordingly. The Contractor will take immediate steps for cancellation of such subcontract. Subletting by Subcontractors shall be subject to the above.

The Contractor shall be fully responsible to the Owner for the acts and omissions of his Subcontractors and of persons either directly or indirectly employed by them. Nothing contained in the Contract Documents shall create a contractual relation between any Subcontractor and the Municipality.

The subcontracting of any of the Work to be done shall in no way relieve the Contractor of any part of his obligations under the Contract.

Article 5.12 Right of the Municipality to Do Work

The Municipality has the right to do Work and may award other Contracts in connection with the Work under this Contract or nearby projects. The Contractor shall conduct his operations to interfere as little as possible with other Contractors or Subcontractors on or near the Work.

Article 5.13 Safeguarding of Excavations

The Contractor shall provide such safeguards and protections around and in the vicinity of all excavations as may be necessary to prevent damage to property or injury to persons.

Contractor shall backfill all trench excavations to the top of the trench at the end of each working day, except, at Contractor's option, he may leave open a "bell-hole" if it is properly barricaded and if adequate signing and warning lights are placed to prevent inadvertent entry by vehicular or pedestrian traffic. If groundwater or surface water results in standing water in the remaining excavation, the Contractor shall provide continuous pumping during the nonworking hours to maintain the excavation in a dewatered condition. All roadways shall be left in a drivable condition for normal vehicular and transport operations at the end of each day's operation, except where the Owner's Representative has approved road or lane closures.

These requirements shall in no way relieve the Contractor of the obligation to restore private property to its preconstruction condition.

Article 5.14 Use of Explosives

In the handling and storage of explosives, the Contractor must comply with all federal, state and municipal laws, and shall use every precaution to prevent injury to persons and damage to property. The Contractor shall provide secure storage places, identified with warning signs. Only persons licensed and experienced in the handling of explosives shall be allowed to use them. Before detonating explosives, the Contractor shall sound a warning and remove all persons from within the radius of danger. The Contractor shall provide proof of license to the Owner's Representative prior to handling and use of explosives.

Article 5.15 Duties of Inspectors

Inspectors will be authorized to inspect all Work and Materials. Such inspection may extend to all or any part of the Work and to the preparation, fabrication, or manufacture of the materials to be used. Inspectors will not be authorized to alter or waive the provisions of the Contract. Inspectors will not be authorized to issue instructions contrary to the Contract Documents or to act as supervisors for the Contractor.

Inspectors will immediately inform the Contractor of any deficiency known to exist in the Work and any laboratory test results related to the Work.

The Contractor's responsibility for Work performed under the Contract shall in no way be relieved because of the presence or absence of an inspector. An inspector, by his presence, does not render Work acceptable.

Article 5.16 Inspection

The Contractor shall allow the Architect/Engineer and his representatives and the Owner's Representative access to all parts of the Work at all times and shall furnish them with every reasonable facility for ascertaining whether or not the Work is in accordance with the requirements and intent of the Contract Documents. Upon the request of the Owner's Representative, the Contractor shall, at any time before Final Acceptance of the Work, remove or uncover such portions of the finished Work as may be directed. After examination, the Contractor shall restore said portions of the Work to the standard required by the Contract Documents. Should the Work thus exposed or examined, prove acceptable, the Owner will pay for the uncovering, removing, replacing of the coverage, and restoration of the parts removed as extra work.

Should the Work so exposed or examined prove unacceptable, the Contractor shall pay for the uncovering, removing, replacing of the covering, and restoration of the parts removed.

Article 5.17 Work Limits, Easements, and Rights-of-Way

The Owner will provide work limits, rights-of-way and easements for the Work. Information regarding the width and status of easements is shown on the Drawings. The

Contractor shall comply with all Supplementary Conditions, provisions, stipulations, and restrictions thereof. The Contractor shall confine his operations to the designated work areas, rights-of-way and easements and shall observe all restrictions. Prior to the start of construction of this project, the Contractor will ensure that all permits necessary for the construction of the project, including right-of-entry for driveway reconstruction, have been obtained and will ensure that they are available on the job site at all times.

The Contractor will be responsible for any trespass upon adjacent property or injury thereto resulting from or in connection with his operations. The Contractor shall be liable for any claims that may be made on account of trespass and shall provide a written statement from the property owner of full restoration or satisfactory resolution prior to Final Acceptance of the Work. The Contractor shall not have the right to remove materials from a right-of-way, easement, or work area unless otherwise provided in the Contract Documents.

Should the Contractor desire to go outside designated work areas, rights-of—way or easements, he shall provide the Owner's Representative with written permission from the property owner before entering such property. The written permission shall specifically provide that the property owner will not hold the Municipality or its employees, agents, or consultants liable for use of or damage to this property.

Article 5.18 Responsibility for Damages

The Contractor shall be responsible for all damages to property; injury to persons; and loss, expense, inconvenience, and delay that may be caused by or that may result from any act, omission, or neglect of the Contractor, his Subcontractors, or his employees in the performance of the Work.

It is specifically understood between the parties executing the Contract that the Contract Documents do not make anyone a third-party beneficiary, nor does the Contract authorize anyone not a party to maintain a lawsuit for personal injuries or property damage.

Article 5.19 Repair of Damages Caused by Contractor

All damage and injury to property that is caused by or that results from the carrying out of the Work, or from any act, omission, or neglect of the Contractor, his Subcontractors, or his employees, shall promptly be remedied by the Contractor either by the repairing, rebuilding, or replacing of the property damaged or in some other manner satisfactory to the owner of such property. In case of failure on the part of the Contractor to promptly and satisfactorily remedy such damage or injury, the Municipality may proceed to repair, rebuild, or replace such property as required, and the cost thereof will be deducted from any monies due or that may become due the Contractor.

In applying the above provisions, the repairing, rebuilding, or replacing of damaged property shall be understood to include the providing of any temporary facilities that may be needed to maintain normal service until the required repairing, rebuilding, or replacing is accomplished.

This provision also applies to all areas used by the Contractor for staging of the construction and shall include restoring those properties to their original condition to the satisfaction of the Owner's Representative.

Article 5.20 Unauthorized and Defective Work

Any unauthorized or defective Work found to exist during construction shall be immediately remedied by the Contractor. If the Contractor fails to correct unauthorized or defective Work, the Owner may, three (3) days after a written notice to the Contractor, correct such deficiencies and deduct the cost thereof from any payment due the Contractor without prejudice to any other remedy including the use of Article 5.29 – Termination of Contract by Owner.

Article 5.21 Changes in the Work

The Owner's Representative shall have the authority to order changes in the Work requiring an adjustment in the Contract amount and/or time. Such changes in the Work shall be performed in accordance with any supplemental Drawings and instructions as the Owner's Representative may issue. Any single change in the Work, or cumulative changes in the Work, which will cause the total value of the Contract to exceed the limits stated in AMC 7.15.080, requires Assembly approval. The Owner will pay for additions to the Work or take credit for reductions to the Work using one of the four methods described below.

1) Negotiated unit or lump sum prices.

2) Time and Material prices (when the Owner's Representative determines that contract prices or negotiated prices do not apply).

3) Contract unit or lump sum prices (if they have been included as a part of the Contract).

4) No cost changes (when the Owner's Representative determines that a change is necessary which does not affect the price or time for the work).

Prior to the Owner's Representative authorizing payment for changed work, the Contractor shall furnish a Change Order Proposal that is itemized as required by the Owner's Representative for both additions and deletions to the Work.

The Contractor's Change Order Proposal shall be in sufficient detail to permit an analysis of all materials, labor, equipment, subcontracts, insurance, bonds, overhead costs and profit and shall cover all Work involved to accomplish the modification whether deleted,

added or changed. Any amount claimed for subcontracts shall be supported by a similar price breakdown. The Contractor agrees that it will incorporate the provisions of this Article 5.21 into all agreements with lower tier subcontractors.

If the Contractor's Change Order Proposal includes a request for a time extension, a justification thereof shall also be furnished. The Change Order Proposal together with the price breakdown and time extension justification shall be furnished by such date as may be specified by the Owner's Representative.

Each Change Order Proposal shall include a clear summary of the contract requirements; the reason for the requested change; a description of the change and whether additional time or other compensation is requested or credit offered to the Owner. Unless agreed at the time of the Owners Representative's acceptance of the Change Order Proposal, and formalized by an executed Change Order, any and all increased costs or delays resulting directly or indirectly from an unapproved Change Order Proposal will be borne solely by the Contractor.

1) Negotiated Changes: When extra work is ordered by the Owner's Representative to be performed on a negotiated unit or lump sum basis, the Contractor will be required to submit a properly itemized Change Order Proposal covering all the additional work and/or work to be deleted. The proposal will be itemized for the various components of work and segregated by labor, material, and equipment costs in a format satisfactory to the Owner's Representative. Each proposal will include similar itemized costs for all subcontractors, regardless of tier. The labor, material and equipment components of each proposal shall include the following:

Allowances for Profit and Overhead for Negotiated Changes:

Contractor Change Order Proposals for the performance of changed work shall include all direct costs for labor, materials, and equipment as described above. The Owner's Representative will review the proposals for reasonableness and adequate detail in order to reach agreement with the Contractor before including allowances as described below:

- In addition to the direct costs of labor, materials and equipment incurred by the Contractor, the Contractor shall be entitled to an allowance for profit and overhead. This allowance shall be 20% of direct costs.

- If work is performed by a subcontractor, the subcontractor actually performing the work shall be entitled to those allowances for profit and overhead listed above, and each subsequent higher tiered subcontractor or Contractor shall be allowed an additional 10% markup on the subcontractor's direct costs, up to a maximum of two tiers of subcontractors.

The allowance made in accordance with the terms outlined above will be understood to be complete reimbursement and compensation for all indirect costs associated with changed work including, but not limited to job office overhead, home office overhead, project management, superintendents, general foremen, estimating, engineering, detailing, legal, accounting, shop drawings, submittals, costs of small tools and small equipment, warranty, bond cost, insurance premiums, and profits.

Any allowance made by the Contractor to a Subcontractor, other than specified herein, shall be at the expense of the Contractor.

2) Time & Material Changes: When extra work is ordered by the Owner's Representative to be performed on a time and materials basis, the Contractor will be required to perform the extra work at the actual direct cost for labor, materials and equipment plus allowances for profit and overhead. In order for payment to occur, the Contractor must document all direct costs in a manner acceptable to the Owner's Representative. The contractor shall provide daily time sheets with the names of all Contractors employees working on the changed work, the number of hours each employee works on the changed work, and a description of the work performed. In addition, the Contractor shall provide daily records of all equipment used to perform the changed work showing the number of hours each piece of equipment was used, a description of the work performed, and the name of the equipment operator. All materials incorporated into the changed work shall be documented with itemized invoices from vendors and suppliers.

Labor:

Labor costs shall include the direct hourly cost of labor stated on the certified payroll for each labor classification plus other direct labor costs including, but not limited to, FICA, Workers' Compensation, ESC, and public liability and property damage insurance when premiums are based on a percentage of payroll. The labor costs shall include only those direct labor hours required to perform the changed work for workers and working foremen. Supervision above the level of working foremen (such as general foremen, superintendents, and project managers, etc.) shall not be included in labor costs and shall be considered to be included in the Overhead and Profit Markup as described later in this Article 5.21.

Materials:

Costs for materials and supplies, including freight, will be based on the net actual cost of the material and supplies required to perform the changed work, as verified by appropriate vendor and third party invoices. Material costs shall reflect cost reductions available to the Contractor due to trade discounts, volume rebates, and price reductions for prompt payments, if applicable. Material costs

must be itemized to display the unit price for each specific item incorporated into the work

Owned Equipment (over $500):

For any machinery or special equipment (other than small tools less than $500) the Contractor shall include costs for the rental rates in the current edition and appropriate volume of the "Rental Rate Blue Book For Construction Equipment," (hereinafter referred to as the "Blue Book"), published by Dataquest, Inc. Hourly rental rates shall be determined as follows:

- The established hourly rental rate shall be equal to the monthly rate for the basic equipment plus the monthly rate for applicable attachments necessary to perform the work, both divided by 176, all multiplied by the area adjustment factor, plus the estimated hourly operating costs listed in the Blue Book.

- The area adjustment factors shall be applied for those sections the "Blue Book" containing an area adjustment map.

- The "Equipment Life" adjustment factor sections shall not apply.

For equipment not listed in the Blue Book, the Contractor shall receive a rental rate as agreed upon before the changed work is begun. If agreement cannot be reached, the Owner's Representative reserves the right to establish a rate based on similar equipment shown in the Blue Book or based on prevailing commercial rates in the area.

Rented Equipment (over $500):

Costs for equipment brought to the work site and rented or leased specifically for work required under this section shall be included at the actual rental rate and supported by invoices from the equipment vendor. Rental rates for equipment shall be consistent with prevailing rates for similar equipment in the area.

Costs for rented equipment previously on the site and utilized specifically for changed work shall be included at the actual rental rate and supported by invoices from the equipment vendor, provided the hourly rate for this equipment shall not be greater than the hourly rate paid for that same equipment for other work in this contract.

Time for both owned and rented equipment will be estimated to the nearest one-quarter hour for purposes of computing compensation to the Contractor for equipment utilized under these rates.

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

When it is necessary to obtain equipment from sources beyond the project limits exclusively for changed work, the actual cost of transferring the equipment to the site of the work and return will be allowed as an additional item of expense. Where the move is made by common carrier, the move-in allowance will be limited to the amount of the freight bill or invoice. If the Contractor hauls the equipment with his own forces, the allowance will be limited to the rental rate for the hauling unit plus operator wages. Move-in allowance shall not be made for equipment brought to the project for changed work which is subsequently retained on the project and utilized for completion of contract items.

- In addition to the direct costs of labor, materials and equipment incurred by the Contractor, the Contractor shall be entitled to an allowance for profit and overhead. This allowance shall be 15% of direct costs.

- If work is performed by a subcontractor, the subcontractor actually performing the work shall be entitled to those allowances for profit and overhead listed above, and each subsequent higher tiered subcontractor or Contractor shall be allowed an additional 10% markup on the subcontractor's direct costs, up to a maximum of two tiers of subcontractors.

The allowance made in accordance with the terms outlined above will be understood to be complete reimbursement and compensation for all indirect costs associated with changed work including, but not limited to job office overhead, home office overhead, project management, superintendents, general foremen, estimating, engineering, detailing, legal, accounting, shop drawings, submittals, costs of small tools and small equipment, warranty, bond cost, insurance premiums, and profits.

Any allowance made by the Contractor to a Subcontractor, other than specified herein, shall be at the expense of the Contractor.

3) Unit Price Changes: When extra work is ordered by the Owner’s Representative to be performed on a unit price basis, the contract amount will be adjusted for both added quantities and deductive quantities in accordance with those unit prices that have been incorporated into the Contract, unless the Owner’s Representative determines there is a

more equitable method. For changed work authorized by the Owner's Representative, the Contractor shall submit a Change Order Proposal itemizing the quantities of each item of work for which there is an applicable unit price. The applicable unit prices will be applied to the net differences of all quantities of the same item. These unit prices will be considered to cover all direct and indirect costs of furnishing and installing the item, including all profit and overhead for contractor and subcontractor.

4) No Cost Changes: The Owner's Representative shall have authority to order changes in the Work that in his opinion do not require an adjustment in the Contract amount or an extension of time and are not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order and shall be binding on the Owner and the Contractor. The Contractor shall carry out such written orders promptly.

If the Contractor claims that such written instructions or orders involve extra costs or an extension of time, he shall make his claim by following the procedures set forth in Article 5.22 - Claims for Additional Compensation. The Contractor shall proceed with the Work as directed by the Owner's Representative while his claim is being evaluated and shall not delay the Work while waiting for a decision.

Article 5.22 Claims for Additional Compensation

Except as elsewhere restricted, the Contractor may make a claim for additional compensation when he believes that he has incurred additional costs due to the acts, errors, or omissions of the Owner. If the Contractor becomes aware of any act or occurrence that may form the basis of a claim, the Contractor shall make every effort to mitigate the extent of any amounts claimed for additional compensation and shall immediately inform the Owner's Representative in writing of the potential for the claim, providing sufficient information to outline the basis of the claim. If the matter is not resolved within seven (7) days, the Contractor shall, within the next fourteen (14) days, submit written notice of the facts that may form the basis of the claim.

Thereafter, the Contractor shall submit the claim in writing to the Owner's Representative within twenty-one (21) days of the submission of the written notice of the facts unless the Owner's Representative agrees in writing to an extension of time for good cause shown. The Owner's Representative may grant up to a sixty (60) day extension only upon the written request of the Contractor in which all reasons for the request are stated. The Contractor agrees that unless these written notices are provided, the Contractor will have no entitlement to compensation for the acts, errors, or omissions of the Owner, the Architect/Engineer, or any other Contractor employed by the Owner. The Contractor shall in all cases continue performance of the Contract.

The written claim presented by the Contractor shall be complete and adequately stated . It shall specifically include the facts and circumstances surrounding the claim and the Contract provisions under which the claim is made; the Contractor's assertion as to the

original requirements of the Contract Documents and the basis for that assertion or position, citing all pertinent Specifications, Details, Plan notes or other Contract provisions; a clear certification that the Contractor's Bid Costs were in fact based on the stated original interpretation; the Contractor's assertion as to the revised requirements of the Contract Documents, citing all pertinent Contract provisions, or lack thereof, and other records on which that assertion or position is based; a narrative description of the increase in the Scope of Work resulting from the revision in the requirements; the Pay Items and quantities affected by the alleged change; references to previous notices of pending claim; and the specific relief requested, including both time extension and additional cost compensation and the basis on which both were calculated. In the case of cost compensation, such basis for specific relief shall include the labor classifications, rates and additional time; the equipment descriptions, rates and additional time; material descriptions, unit prices and quantities; and appropriate supporting documentation as to materials, unit prices, labor rates, and equipment rates.

Claims presented that do not include the above information or are otherwise considered to be incomplete will be returned to the Contractor without review by the Owner's Representative. The Owner's Representative will render a decision as to the merit of a properly presented claim within sixty (60) days of its receipt. Any change in the Contract amount resulting from such claim will be subject to approval by the Owner through the execution of a Change Order.

Article 5.23 Time for Completion of Work

The Owner shall indicate in the Supplementary Conditions either a time period for completion of the Work or a completion date. Time is of the essence in the Contract. Therefore, the Work to be performed under the Contract shall be completed in its entirety within the time period specified or before the completion date.

The Contractor shall furnish all labor, materials, facilities, and equipment and shall work the required hours, including night shifts, overtime operations, and Saturdays, Sundays, and holidays (per the requirements in Article 5.4 – Unusual Working Hours, Holidays, Saturdays, and Sundays) as may be necessary to ensure the completion of the Work within the time specified.

Failure of the Contractor to comply with the requirements of this Article may be considered grounds for termination under the provisions of Article 5.29 - Termination of Contract by Owner.

Article 5.24 Delays and Extension of Time

If the Contractor is delayed, beyond his control and without fault or negligence on his part, at any time in the progress of the Work by any act or neglect of the Owner or by changes ordered in the Work or by labor disputes, fire, unusual delay in transportation, adverse weather conditions not reasonably anticipated, unavailability of materials for which orders were timely placed, or by unavoidable casualties, then the time period for completion or the completion date may be extended by a Change Order, for such reasonable time as

the Owner's Representative may determine, without invalidating any of the provisions of the Contract and without the consent of the Surety.

Any claim for extension of time shall be made in accordance with the procedures set forth in Article 5.22 - Claims for Additional Compensation. In the case of a continuing delay, only one claim is necessary. The Contractor shall provide an estimate of the probable impact of such delay on the progress of the Work.

Article 5.25 Suspension of Work

By executing a contract, the Contractor agrees that the Owner has the undisputed right to suspend the Work and that this right is a material condition of the contract. The Contractor shall immediately suspend the Work as directed in the written order. Failure of the Contractor to immediately suspend the Work as directed shall constitute a material and immediate breach of the contract by the Contractor. The Owner may terminate this contract for default without providing the ten (10) day notice specified in Article 5.29 – Termination of Contract by Owner, should the Contractor fail, refuse or otherwise not immediately suspend the Work as directed.

The Work may be suspended in whole or in part by order of the Owner's Representative for the convenience of the Owner. The Contractor shall take every precaution to prevent any damage or unreasonable deterioration of the Work during the time it is suspended. Suspension of the Work by the Owner's Representative for the convenience of the Owner may furnish grounds for a claim by the Contractor for additional compensation and/or a time extension, in which case the Contractor, when making a claim, shall comply with the provisions of Article 5.22 - Claims for Additional Compensation.

Upon the failure of the Contractor to carry out the orders of the Owner's Representative or to perform in accordance with the Contract Documents, the Owner's Representative may suspend the Work for such period as may be necessary. Time lost by reason of such suspension, or replacement of improper work or material, shall not furnish any grounds to the Contractor for claiming additional compensation and/or an extension of time and shall not release the Contractor from any liability for damages or for failure to complete the Work within the time prescribed.

In the event that a suspension of Work is ordered in writing by the Owner's Representative due to unsuitable weather or unforeseen conditions, and, in the opinion of the Owner's Representative, the Contractor has prosecuted the Work with due diligence prior to the time of suspension, the Contractor may be due an extension of time.

Where the Contract provides for a time period for completion and the Work is suspended for the convenience of the Owner or unsuitable weather or unforeseen conditions and the Contractor has prosecuted the Work with due diligence, the time period and liquidated damages provision of the Contract shall be tolled until a Notice to Resume Work is issued by the Owner's Representative.

Article 5.26 Final Trimming of Work

The Contractor shall be responsible for all repair to the Work as necessary to overcome deterioration or damage that may occur prior to final inspection. The Contractor at all times shall keep the premises free from accumulation of waste materials, rubbish, and debris. The Contractor shall grade all existing driveways on, and which have been affected by the project within the rights-of-way or easements as directed by the Owner's Representative. At the completion of the Work, all waste materials, rubbish, debris and temporary structures from and about the Project as well as all his tools, construction equipment, machinery, and surplus materials shall have been removed from the Project area. The Work shall be in a neatly trimmed and well-finished condition throughout the Project area at the time of Final Inspection. This Work shall be considered incidental to the contract unless there is a specific contract item for this Work.

At any time during the progress of construction that cleanup is not keeping pace with the rest of the Work in the opinion of the Owner's Representative, the Contractor shall at the direction of the Owner's Representative suspend all operations on the major items of work until the premises are cleaned up to the satisfaction of the Owner. Any additional expense involved will be the sole responsibility of the Contractor, and the Owner will not be held liable for this additional expense.

All street name signs, traffic control signs, mailboxes, newspaper boxes, property corner markers, survey markers, survey monuments, and utility markers removed to facilitate the Work or damaged by the Contractor's operations shall be restored by the Contractor unless otherwise directed. Items damaged by the Contractor during removal, storage, or restoration shall be repaired or replaced in kind by the Contractor. Repairing or replacing damaged items shall be considered incidental to the Contract, and no separate payment shall be made.

Article 5.27 Final Inspection

When the Contractor, by his own comprehensive inspection, has concluded that all Work is completed, all code compliance inspections are performed, and all other contract requirements are fulfilled, he shall notify the Owner's Representative in writing of completion and request a pre-final inspection of the Project. This inspection will be performed in the presence of a representative of the Owner, the Architect/Engineer, and the Contractor. The Contractor will make available copies of all required code compliance inspection reports at this inspection. All deficiencies indicated by this inspection will be listed and promptly furnished to the Contractor for remedial action. When all listed deficiencies have been corrected, the Contractor shall notify the Owner's Representative, and a Final Inspection will be performed. When the Final Inspection verifies correction of the listed deficiencies, the Owner's Representative will issue a Certificate of Completion.

When the Final Inspection reveals uncorrected listed deficiencies, the above outlined procedure shall be repeated and the cost of reinspection will be deducted from any money due the Contractor. This cost will include, but is not limited to, salaries, administrative, and transportation costs.

Article 5.28 Liquidated Damages

For each calendar day that the Substantial Completion and/or Final Acceptance date is delayed beyond the Contract Completion Date, the sum per day listed in the Supplementary Conditions shall be deducted from any monies due the Contractor. After Substantial Completion, the Owner shall deduct from any monies due the Contractor the sum per day listed in the Special Provisions for every calendar day that the Final Acceptance date is delayed beyond the Contract Completion Date. If no money is due the Contractor, the Owner shall have the right to recover said sums from the Contractor or the Surety, or both.

The Contractor acknowledges that the daily amount of the Liquidated Damages provision is not a penalty but rather is a reimbursement for damages that the Owner will sustain by reason of delayed completion. The Contractor further acknowledges that the daily amount of Liquidated Damages is a reasonable alternative to the complex calculations that would otherwise be necessary to determine such damages.

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

Article 5.29 Termination of Contract by Owner

If the Contractor should be adjudged bankrupt; if he should make a general assignment for the benefit of his creditors; if a receiver should be appointed on account of his insolvency; if he should persistently or repeatedly refuse or fail to supply enough properly skilled workmen or proper materials for the efficient prosecution of the Work; or if he should persistently disregard laws, ordinances, or the instructions of the Owner's Representative, or otherwise substantially violate any provisions of the Contract, then the Owner may without prejudice to any other right or remedy and after giving the Contractor and his Surety ten (10) days concurrent written notice, terminate the Contract and take possession of the premises and of all materials, tools, and appliances thereon. Notwithstanding the preceding, the Owner may immediately terminate this contract for default without providing a ten (10) day notice if the Contractor fails, refuses or otherwise does not comply with a written order by the Owner's Representative that may involve issues of safety or a suspension of work issued under Article 5.25 – Suspension of the Work. When the Contractor and Surety are notified of the termination of the Contract, the Owner may demand that the Surety fulfill its obligations under the Performance and Payment Bond. Should the Surety fail to perform its obligations under the Bond upon demand of the Owner, then the Owner may finish the Work by whatever method that the Owner determines expedient. The Contractor and his surety shall be responsible for compensating the owner for all excess costs, including applicable liquidated damages and all added procurement costs incurred in accomplishment of the Contract Work.

In the event that the Owner terminates the Contract, the Owner does not waive any other right or remedy under the Contract or any other right or remedy available at law or equity.

The Contractor may not be allowed to bid on any Owner's contracts for a period of two (2) years following the date of this termination by the Owner.

In the case of termination before completion for any cause whatsoever, the Contractor, if notified to do so by the Owner, shall promptly remove equipment and supplies from the premises of the Owner. Failure to do so will authorize the Owner to remove such equipment and supplies from the premises at the expense of the Contractor.

Article 5.30 Termination of Work for Owner's Convenience

At any time during the term of this contract, the Owner may terminate the Work, in whole or in part, for any reason that the Owner's Representative shall determine to be in the best interest of the Owner. Any such termination shall be effected by delivery of a Notice of Termination to the Contractor, specifying that the termination is for the convenience of the Owner; the extent to which performance of the Work under the Contract is terminated; and the date upon which such termination becomes effective.

After receipt of a Notice of Termination and except as otherwise directed by the Owner, the Contractor shall:

1. Stop work under the contract on the date and to the extent specified in the Notice of Termination;

2. Place no further orders or subcontracts for materials, services, or facilities except as may be necessary for completion of such portion of the Work under the contract as is not terminated;

3. Terminate all orders and subcontracts to the extent that they relate to the performance of Work terminated by the Notice of Termination;

4. Settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, the cost of which would be reimbursable, in whole, or in part, in accordance with the provisions of the contract;

5. Submit to the Owner's Representative a list, certified as to quantity and quality, of any or all termination inventory items, excluding items that the Owner's Representative directed or authorized disposition of;

6. Transfer to the Owner's Representative the completed or partially completed plans, drawings, information, and other property that, if the contract had been completed, would be required to be furnished to the Owner;

7. Take such action as may be necessary or as the Owner's Representative may direct for the protection and preservation of the contract-related property that is in the possession of the Contractor and in which the Owner has or may acquire any interest.

The Contractor shall proceed immediately with the performance of the above obligations notwithstanding any delay in determining or adjusting the amount of any item of reimbursable cost under this clause.

When the Owner orders termination of Work, effective on a certain date, all completed Work will be paid for at the contract price. Payment for materials included in the material inventory described in item 5 listed above will be paid at actual cost delivered to the project or storage site, including transportation charges. Allowable total markup on the actual cost shall be fifteen percent (15%).

After receipt of a Notice of Termination, the Contractor shall submit to the Owner's Representative his claim for alleged additional damages or costs not covered above or elsewhere in these specifications as provided in Article 5.22 – Claims for Additional Compensation. In no event, however, will loss of anticipated profits be considered as part of any settlement.

Article 5.31 Use of Completed or Uncompleted Portions

The Owner shall have the right to take possession of and use any completed or partially completed portions of the Work, prior to the date specified for completion, and such action and use shall not be considered an acceptance of that Work. If such use by the Owner causes additional expense to the Contractor and/or delay in the Work, the Contractor may be entitled to additional compensation and/or an extension of time. Claims for additional compensation or a time extension shall follow the procedures set forth in Article 5.22 - Claims for Additional Compensation. The Owner shall be responsible for routine maintenance or damages caused by the Owner's use of such portions of the Work.

Article 5.32 Preconstruction Conference

Within five (5) days after delivery of the executed agreement by the Owner to Contractor, but before the Contractor begins the Work at the site, a Preconstruction Conference will be held to review the contractor's schedules and plans, to establish procedures for handling shop drawings and other submissions, to establish procedures for submitting and processing applications for payment, and to establish a working understanding between the parties as to the project. The Owner or his Representative, the Architect/Engineer, the Inspector, and the Contractor and his Superintendent and key Subcontractors' representatives will be present at the meeting. Construction Progress Meetings will be conducted each month on a scheduled basis to review work progress, schedules, and other matters requiring discussion and resolution. At a minimum, the Owner, Architect/Engineer, and Contractor's Project Manager, or their representatives,

will attend the Construction Progress Meetings, which will be conducted on the project site.

SECTION 00 72 13.06 LEGAL RELATIONS AND RESPONSIBILITIES

Article 6.1 Laws to Be Observed

The Contract shall be governed by the laws of the State of Alaska. The Contractor at all times shall observe and comply with all federal, state, and municipal laws, ordinances, and regulations in any manner affecting the conduct of the Work and all such orders or decrees existing or which may be enacted or promulgated by legislative bodies, boards, tribunals, or courts having any jurisdiction or authority over the Work. The Contractor shall defend, indemnify, and hold harmless the Municipality and the officers, employees, and agents of the Owner, including the Architect/Engineer, against any claim or liability arising from or based on the violation of any such laws, ordinances, regulations, orders, or decrees, whether such violations be by the Contractor, his Subcontractor, or his employees.

Article 6.2 Notice to Contractors

Any written notice to the Contractor by the Owner shall be served on said Contractor or his representative either personally or by mailing to the address given in the Contract.

Article 6.3 Notice by Contractors

Any notice to the Owner by the Contractor shall be made in writing and shall be delivered to the Owner's Representative or his representative in person or mailed to the office of the Owner's Representative at the address given in the official Notice to Proceed.

Article 6.4 Successors and Assigns

The Contractor binds himself, his partners, successors, assignees, and legal representatives to the Owner with respect to all covenants, conditions, and obligations contained in the Contract Documents.

Article 6.5 Assignments

The Contractor shall not assign the whole or any part of the Contract or any monies due or to become due the Contractor without written consent of the Owner. If the Contractor assigns all or any part of any monies due or to become due him, the instrument of assignment shall state that the right of the assignee in and to any monies due or to become due to the Contractor shall be subject to prior claims of all persons, firms, and corporations who performed Work or supplied materials under the Contract.

Article 6.6 Permits

All permits or licenses not required to be obtained by the Owner but which are required by any federal, state, or municipal governmental agency or any public utility shall be obtained and paid for by the Contractor when such permits or licenses are necessary for the prosecution of the Work. The Contractor shall be responsible for all stipulations of these permits and shall be responsible for all costs associated with these permits and their stipulations.

It will be the Contractor's responsibility to give all notices and comply with all laws, ordinances, rules, and regulations bearing on the conduct of the Work as specified herein. The Contractor shall also be responsible for requesting all code compliance inspections.

The Owner will obtain the required permits and authorizations for Work within the Alaska Railroad Corporation rights-of-way and permits from the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, and the Alaska Department of Fish and Game. Prior to the start of construction within the scope of such permits, the Contractor shall obtain the necessary approvals and permits relating to the method, plan, and exact schedule of construction for any Work within such rights-of-way, creeks, and wetlands. Failure on the part of the Contractor to comply with any of the stipulations of any of the applicable Owner- or Contractor-acquired permits shall be sufficient cause for the Owner to suspend that Work.

The payment of basic and special fees, established under Anchorage Municipal Code (AMC) Chapter 24.30, AMC 24.30.100.A, AMC 24.30.100.B, and AMC 24.30.100.F,

Permit Fees for Permanent Uses of Public Places (street use ordinance), and which are applicable to the Work, shall not be the responsibility of the Contractor. These fees shall not be considered a bid item, nor shall they be considered incidental to any bid item.

The Contractor shall be responsible for applying for permits and fulfilling all other requirements of the MASS, the Municipal Code, and the Director of the Municipality of Anchorage’s Office of Planning, Development, and Public Works pertinent to the approval and issuance of the permits.

The Contractor shall obtain and pay for all permits, deposits and connection fees for tapping any required water and/or wastewater service connection permits for new and disrupted service connections.

Article 6.7 Copyrights and Patents

The Contractor shall defend, indemnify, and hold harmless the Municipality, its officers, its employees, and agents of the Owner, including the Architect/Engineer, from any and all claims, suits, or actions brought for the infringement of any copyright or patent claimed to be infringed by any material, devices, drawings, method, or process to be

incorporated in the Work and/or required to be used in connection with the Work, including all attorney's fees and costs.

Article 6.8 Safety

The Contractor shall be solely and completely responsible for conditions of the job site, including safety of all persons (including employees, Owner's Representatives, and the public) and property during performance of the Work. This requirement shall apply continuously twenty-four (24) hours per day, seven (7) days per week and shall not be limited to normal working hours. Safety provisions shall conform to the rules and regulations established by the U.S. Department of Labor, the Occupational Safety and Health Administration (OSHA), the State of Alaska Occupational Safety and Health Section (OSH), as well as all other applicable federal, state, or municipal laws, ordinances, codes, the requirements set forth below, and any regulations that may be detailed on other parts of the Contract Documents. Where any of these are in conflict, the more stringent requirement shall be followed. The Contractor's failure to thoroughly familiarize himself with the aforementioned safety provisions shall not relieve him from compliance with the obligations and penalties set forth herein.

The Contractor shall develop and maintain, for the duration of this Contract, a safety program that will effectively incorporate and implement all required safety provisions. The Contractor shall appoint an employee who is qualified and authorized to supervise and enforce compliance with the safety program and shall notify the Owner's Representative of the name and contact phone number for this person prior to commencement of the Work.

The duty of the Owner's Representative to conduct construction review of the Work does not include review or approval of the adequacy of the Contractor's safety supervisor, the safety program, or any safety measures taken in, on, or near the construction site.

If death, serious injuries, or serious damages are caused, the accident shall be reported immediately by telephone or messenger to both the Architect/Engineer and the Owner. In addition, the Contractor must promptly report in writing to the Owner's Representative all accidents whatsoever arising out of, or in connection with, the performance of the Work, whether on, or adjacent to, the site, giving full details and statements of witnesses.

If a claim is made by anyone against the Contractor or any Subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the Owner's Representative, giving full details of the claim.

Failure to comply with all applicable safety rules and regulations, notwithstanding any other provision of the Contract, is sufficient cause for termination under the provisions of the Contract.

Article 6.9 Insurance

Before signing the Contract or commencing the Work or allowing any Subcontractor to commence Work, the Contractor shall obtain all insurance required under this Article. The Contractor shall maintain this insurance until the Final Acceptance Date. The Contractor shall file with the Purchasing Officer as verification of insurance a certificate of insurance on the forms furnished, showing the type and amounts of insurance, the policy number, the expiration date, and the signature of an authorized representative of the insurance company. The insurance company must provide written notification to the MOA contract administrator of any material change, cancellation, or non-renewal of the insurance policies. If the insurer does not notify the MOA in these circumstances, it will be the contractor's responsibility to make that notification. All insurance policies required under this Article shall name the Municipality as an additional insured for the purposes of the Project and shall contain a waiver of subrogation against the Municipality.

The Contractor shall provide the following types of insurance:

Workers' Compensation	**Minimum Limits**
$500,000 Employers Liability and Workers' Compensation as required by Alaska State Workers' Compensation Statutes	Statutory

Commercial General Liability	**Minimum Limits**
Bodily Injury and Property Damage Liability Premises Operations including explosion, collapse and underground; Products and Complete Operations; Broad Form Property Damage; Blanket Contractual; Personal Injury; Owner's/Contractor's Protection	$1,000,000 Combined Limit Each Occurrence and $2,000,000 Aggregate

Commercial Automobile Liability	**Minimum Limits**
Bodily Injury and Property Damage, including all owned, hired, and non-owned automobiles	$1,000,000 Combined Limit per Occurrence

When specified in the Supplementary Conditions**,** the Contractor shall provide the following additional coverages:

Coverages	**Minimum Limits**
Federal Longshoremen and Harbor Workers Compensation Act :	Statutory
Federal Maritime Liability Law (Jones Act:)	$1,000,000
Builder's Risk:	Total Contract Amount

NOTICE TO “OUT OF STATE” CONTRACTORS:

A Certificate of Insurance for Alaska Worker’s Compensation, or an “other states” endorsement on your home state Worker’s Compensation policy, is required prior to execution of a Contract or commencement of any contract performance, if any in-state visits or Work is required or anticipated.

Article 6.10 Indemnification

To the fullest extent permitted by law, the Contractor shall indemnify, defend, and hold harmless the Municipality and the Architect/Engineer and their agents and employees from and against all claims, damages, losses, and expenses, including attorneys' fees, arising out of or resulting from the performance of the Work, provided that any such claim, damage, loss, or expense (1) is attributable to bodily injury, sickness, disease, death, or personal injury or to injury to or destruction of tangible property including the loss of use resulting therefrom; and (2) is caused in whole or in part by any negligent act or omission of the Contractor, any Subcontractor, anyone directly or indirectly employed by the Contractor or Subcontractors, or anyone for whose acts the Contractor or Subcontractors may be liable, regardless of whether or not the claim, damage, loss, or expense is caused in part by a party indemnified hereunder.

In any and all claims against the Municipality or the Architect/Engineer or their agents or employees by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation under this Article shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the Contractor or any Subcontractor under Worker's Compensation acts, disability benefit acts, or other employee benefit acts.

Article 6.11 Claims by Workers, Suppliers, and Subcontractors

In the event the Contractor or any Subcontractor fails, neglects, or refuses to make prompt and full payment for labor, services, materials, supplies, or provisions furnished by any person in connection with the Work, then the Owner may withhold the amount due from the Contractor's progress payments provided that an affidavit of claim on the form furnished is filed with the Owner’s Representative. The withholding by the Owner does not relieve the Contractor or his Surety from their obligations with respect to the payment

of such claims. Sums withheld from progress payments will be disbursed pursuant to Article 7.5 - Payment of Claimants.

Article 6.12 Certified Payroll

The Contractor shall file a certified payroll on Friday of each week that covers the preceding week; the payroll shall be filed with the State of Alaska Department of Labor, Labor Standards and Safety Division, Wage and Hour Administration.

Article 6.13 Lawsuits

If a lawsuit is filed by the Contractor or his Surety against the Municipality or by the Municipality against the Contractor or his Surety, the suit shall be commenced in the Superior Court, Third Judicial District, in Anchorage, Alaska.

If one of the questions at issue is the satisfactory performance of the Work by the Contractor, and should the appropriate Court decide that the Work of the Contractor was unsatisfactory, then the Contractor or his Surety shall reimburse the Owner for all legal and all other expenses incurred by the Owner because of the lawsuit as may be allowed and set by the Court. Further, it is agreed that the Owner may deduct such costs from any sum or sums then due or that may become due the Contractor under the Contract.

If any clause or condition of the Contract is held as a matter of law to be unenforceable or unconscionable, the remainder of the Contract shall be enforceable without such clause.

Article 6.14 Preference to Local Labor

The Contractor shall comply with the Provisions of Title 36, Chapter 10 of the Alaska Statutes requiring employment preference for Alaska residents.

Article 6.15 State of Alaska Prevailing Wage Scale

The Contractor shall comply with the Provisions of Title 36 of the Alaska Statutes for the payment of prevailing wages to their employees.

If the contract contains State of Alaska wage rates and a federal wage decision, the Contractor and all Subcontractors shall comply with both wage decisions. The Contractor and all Subcontractors shall be responsible for paying the higher pay rate between the state and federal wage decisions. Additionally, the Contractor and all Subcontractors shall be responsible for providing certified payrolls, to the State of Alaska Department of Labor, Wage and Hour Division on a weekly basis, using the appropriate agency’s form(s) and, upon request to the Contract Administrator.

Article 6.16 Nondiscrimination

The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, national origin, ancestry, age, sex, or marital status or any employee or applicant who is a "qualified individual with a disability"

(As defined in the Americans with Disabilities Act of 1990). The Contractor shall take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their race, color, religion, national origin, ancestry, age, sex, marital status, or mental or physical impairment/disability. Such action shall include, without limitation, the following: employment, upgrading, demotion, or transfer; recruitment or recruiting advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

The Contractor shall state in all solicitations or advertisements for employees for the Work that all qualified applicants will receive consideration for employment without regard to race, color, religion, national origin, ancestry, age, sex, marital status, or mental or physical impairment/disability.

The Contractor shall include the provisions of the first two paragraphs of this section in every subcontract or purchase order under this contract, so as to be binding upon every such Subcontractor or vendor of the Contractor under this contract.

Article 6.17 Rights and Remedies

The duties and obligations of the Contractor imposed by the Contract Documents and the rights and remedies of the Owner available thereunder shall be in addition to and not a limitation of any duties, obligations, rights, and remedies otherwise imposed or available by law.

The failure of the Owner or the Architect/Engineer to insist in any one or more instances upon the strict performance of any one or more of the provisions of the Contract, or to exercise any right herein contained or provided by law, shall not be construed as a waiver or relinquishment of the performance of such provision or right(s) or of the right to subsequently demand such strict performance or exercise of such right(s), and the rights shall continue unchanged and remain in full force and effect.

Article 6.18 Payment of Taxes

As a condition of performance of this contract, the Contractor shall pay all municipal taxes incurred by the Contractor. Payment of such taxes is required before the Municipality will issue any payment to the Contractor for Work.

SECTION 00 72 13.07 MEASUREMENT AND PAYMENT

Article 7.1 Payment to Contractor

The contract amount shall be lump sum as stated in the contract and shall include any authorized adjustment(s). The contract amount represents the total amount payable to the Contractor by the Owner for performance of the Work as required by the Contract Documents.

Prior to the first application for payment, the Contractor shall submit a Schedule of Values (as described in Article 5.3 – Construction Progress Schedule and Schedule of Values), which outlines material and labor in categories that allocate portions of the Work in a detailed manner. The allocations, at a minimum, shall address the portions of the Work listed in the Table of Contents of the Specifications.

Article 7.2 Scope of Payment

The Contractor shall accept the compensation as herein provided in full payment for the Work. The Contractor shall do all things necessary to perform and to complete the Work according to the Contract Documents, including but not limited to furnishing all labor, tools, implements, machinery, supplies, materials, water, heat, utilities, transportation, and permits necessary to perform the Work. The Contractor shall be responsible for all loss, damage, or liability arising from the nature of the Work, from the action of the elements, or from any unforeseen difficulties that may be encountered. Work paid for under one item will not be paid for under another item.

The contract price shall constitute full compensation for furnishing all labor, equipment, and materials and performing all operations required to complete the Work as specified and as shown on the drawings or otherwise directed. Notwithstanding the omission or mention of any incident or incidental Work, the contract price and payment shall also constitute full compensation for all work incident or incidental to completion of the items, unless such Work is otherwise specifically mentioned for separate payment under another bid item. In the event any Work is required by the specifications or by the bidding schedule and is not directly incident or incidental to the completion of any such items, the contract price or prices for all enumerated items shall also constitute full compensation of such Work.

In this Section 00700.07, the terms "construct, furnish, install, erect, place, and prepare," shall be construed to mean that the bid item(s) is (are) complete, in place, and approved by the Owner's Representative.

Article 7.3 Advances on Materials

The Contractor may request advance payment for materials to be incorporated in the Work, provided such materials are delivered and stored at the site or, if approved by the Owner's Representative, at another site within the Municipality. The Contractor shall be solely responsible for the protection of these materials. Only the Contractor's costs of materials (including freight), as verified by invoices, will be considered for such advance payments by the Owner.

No payment for materials shall be made on any single class of material the value of which is not at least $5,000. No advance shall be made for fuels, supplies, forms, lumber, falsework, or other materials or on temporary structures of any kind that will not become an integral part of the finished construction.

The Contractor shall make available to the Owner's Representative evidence of payment for the materials for which it is requesting advances and of insurance to ensure replacement if such material is lost, stolen, or damaged; and other information the Owner's Representative may request.

Article 7.4 Progress Payments

The Contractor shall submit to the Owner's Representative an Application for Payment, on the forms furnished, supported by such data as the Owner's Representative may require that substantiate the Contractor's right to payment for Work done during the preceding calendar month. The Owner's Representative will, within eight (8) days after receipt of the Application for Payment, either approve a Partial Payment Estimate and present it to the Contractor for signature or notify the Contractor in writing of his reasons for withholding approval. Approved Partial Payment Estimates shall be received by the Owner within two (2) days after execution by the Contractor.

The Owner will process Partial Payment Estimates and make payment to the Contractor within fifteen (15) days of receipt of the Partial Payment Estimate. If the Owner fails to make payment to the Contractor within thirty (30) days (twenty-one [21] days if the project is funded with State of Alaska grants) of receipt of the Application for Payment, the Contractor may, upon seven (7) days written notice to the Owner, suspend the Work. The Contractor shall take every precaution to prevent any damage or unreasonable deterioration of the Work during the time it is suspended.

Retainage: For projects where a Performance and Payment Bond is required, under Article 3.5 – Bonds and Insurance, progress payments at one hundred percent (100%) of the estimated value of the work accomplished, less all previous payments, shall be made to the Contractor, and no retainage shall be deducted, except as provided under the withholding provisions of this Article (Article 7.4).

For projects where a Performance and Payment Bond is not required under Article 3.5 – Bonds, Insurance. The Owner will retain ten percent (10%) of the total earnings to date until the Work is completed and accepted. However, if the Owner at any time after fifty percent (50%) of the Work has been completed determines that satisfactory progress is maintained, the Owner may continue to hold the retainage to date and authorize progress payments to the Contractor in full for Work performed beyond the fifty percent (50%) stage of completion. After ninety-five percent (95%) of the Work has been satisfactorily completed, the Owner may reduce the retention to two percent (2%) of the earnings to date. Interest on retainage shall accrue at the rate of eight percent (8%) per annum, simple interest, or, when the State of Alaska is to provide a grant for all or part of the

funding for the Work, the rate of interest will be equal to the amount set out in Alaska Statute (AS) 45.45.010(a).

No interest shall accrue and no interest shall be paid on sums that are withheld as provided for hereinafter.

Withholding: The Owner's Representative may withhold from a progress payment for any of the following reasons:

1. Defective Work;

2. Claims made directly against the Municipality alleging an act or omission on the part of the Contractor, Subcontractors, or their agents in connection with the Work;

3. Damage to the Municipality;

4. Reimbursements for Work done by the Owner because of any failure to carry out the Work in accordance with the Contract Documents;

5. Uncompleted incidental work, not earning direct payment, including but not limited to testing, cleanup, updating of progress schedules, and preparation of Record Documents and Operation and Maintenance Manuals;

6. Liquidated damages;

7. Claims by Subcontractors, suppliers, laborers, or the Alaska Department of Labor.

The amount of any withholding for items 1-5 listed above shall be the reasonable value of the Work or remedy to be accomplished as estimated by the Owner's Representative, without regard to bid amount or cost to the Contractor. The amount of withholding for items 6-8 shall be in accordance with the claimed amount or the applicable contract provisions.

Progress payments shall not be construed as an acceptance or approval of any part of the Work covered thereby, and they shall in no manner relieve the Contractor of responsibility for correcting defective workmanship or material.

The estimates upon which progress payments are based are not represented to be accurate estimates, and all quantities shown therein are subject to correction on any subsequent pay estimate. If the Contractor uses such estimates as a basis for making payment to Subcontractors, he does so at his own risk, and he shall bear all loss that may result.

The making of progress payment under the Contract, either before or after the date set for completion of the Work, shall not operate to invalidate any of the provisions of the Contract or to release the Surety.

Article 7.5 Payment of Claimants

Any claim received by the Owner's Representative against the Contractor or Subcontractors from any material men, laborer, supplier, Subcontractor, or the Alaska Department of Labor will be forwarded to the Contractor by certified mail as soon as practical following receipt by the Owner's Representative. Within twenty-one (21) days after the Contractor's receipt of the said notice, the Contractor shall notify the Owner's Representative in writing by Certified Mail that the said claim is contested or provide proof that the claim has been satisfied. If the Contractor contests the claim, the Contractor shall describe in detail how the Subcontractor was paid or why the Subcontractor should not be paid and furnish the 3-point statement described below. If the Contractor does not respond during the time allotted above, this lack of notice shall constitute consent by the Contractor to have the owner pay the claim from the earnings of the Contractor.

The Owner shall not be responsible to the Contractor if the Contractor subsequently contests the validity of the claim. Sums withheld pursuant to disputed claims will not be paid to the claimant except where compelled by legal authority. Such sums may be paid to the Contractor upon the filing of a 3-point statement by the Contractor and his Surety on the form furnished by the Owner's Representative stating that: (1) the Contractor contests the validity of the claim, (2) the Surety acknowledges responsibility for the payment of the claim in the event it is valid, and (3) that the Contractor and the Surety specifically agree to hold the Municipality harmless for making payment to the Contractor of the sums withheld.

In the event that the Contractor revokes consent to pay a claimant as provided herein and refuses to execute the said statement referenced above, the Municipality may institute an interpleader action in Superior Court, Third Judicial District, and all Court costs and attorney's fees incurred by the Municipality shall be paid by the Contractor or the Surety. Claimants are not intended beneficiaries of this Article and shall have no recourse against the Municipality for any failure to pay claims from sums withheld from the Contractor.

Article 7.6 Final Payment

Upon completion of the Work and issuance of a certificate of completion by the Owner's Representative, the Contractor shall submit a request to the Owner's Representative for the final payment. The retainage shall be held by the Owner for a period of not less than ninety (90) days following the Final Acceptance of the Work. No final payment shall be made until the Contractor has filed with the Owner's Representative, prior to acceptance of the Work, a notarized Certificate of Compliance as follows:

> I (we) hereby certify that all Work has been performed and materials supplied in accordance with the Contract Documents for the above Work; that not less than the prevailing rates of wages as required by the State of Alaska statute have been paid to laborers, workers, and mechanics; that all payroll taxes have been paid; and that all claims for material and labor and other services performed in connection with these Contract Documents have been satisfied.

There shall be deducted from the final payment any sums withheld pursuant to Article 7.5 - Payment of Claimants.

Article 7.7 Correction of Work After Final Payment

Neither the final payment nor any progress payment shall relieve the Contractor of his responsibility for paying all costs resulting from defects in materials or workmanship supplied under the terms of this contract, and for correction of those defects, for a period of one (1) year following the Final Acceptance Date. The Owner shall give notice of observed defects with reasonable promptness. The Contractor shall initiate corrective action within five (5) days after written notification from the Owner, or the Owner will make other provisions to complete the Work, and all costs shall be paid by the Contractor.

END OF SECTION

MAINTENANCE AND OPERATIONS

PERFORMING ARTS CENTER ELEVATOR MODERNIZATION

SUPPLEMENTARY CONDITIONS

SECTION 00 72 13.02 BIDDING REQUIREMENTS AND CONDITIONS

Article 2.2 Interpretation or Correction of Bidding Documents

Add the following definition:

The following supplements, modifies, changes, deletes from or adds to the Section 00 72 13 of the Municipality of Anchorage - Standard Specifications-Building (MASSB). Where any Article, Paragraph, Subparagraph, or Clause is modified, or added by these Supplementary Conditions, the unaltered provisions of the Article, Paragraph, Subparagraph, or Clause shall remain in effect. If the Supplementary Conditions conflict with any general condition it shall supersede the conflicting item.

SECTION 00 72 13.03 AWARD AND EXECUTION OF CONTRACT

Article 3.6 Execution of Contract

Paragraph four (4) Modify the following:

The Municipality will supply the Contractor with the Contract Documents, which includes the ITB (Invitation to Bid) Book and Drawing Set; the Contractor may request additional copies which the Municipality will supply, up to (4) sets.

Article 3.7 Contractor's Warranty

At the end of Paragraph one (1) Add the following:

The Contractor shall extend to the Municipality such other bond, warranty of manufacturer or any other guarantee given on any material, goods, equipment, or workmanship included in the work.

SECTION 00 72 13.05 CONTROL OF WORK

Article 5.23 Time for Completion of Work

Add the following at the end of paragraph one:

All work shall start no earlier than May 1, 2023 and must be complete no later than September 1, 2023.

Article 5.28 Liquidated Damages

Add the following at the end of paragraph one:

Liquidated damages under this contract will be $250.00 per day.

SECTION 00 72 13.06 LEGAL RELATIONS AND RESPONSIBILITIES

Article 6.6 Permits

Add the following after paragraph three:

The plans have been reviewed for code compliance by Building Safety the permit number is **C22-1232**. The Contractor shall use this permit number to identify this project to Building Safety. Two (2) Inspections have been paid for by the Municipality of Anchorage, any additional inspections required to obtain the Certificate of Occupancy shall be the responsibility of the contractor. The Contractor shall obtain certificates of inspection from the appropriate municipal, state, or federal inspector and submit them to the Contract Administrator. The Contractor shall provide the Contract Administrator with a copy of the issued permits and invoice for the first progress payment. The Contractor shall provide the Contract Administrator a copy of the Certificate of Occupancy with the final invoice for the project.

Special Inspections:
Special Inspections will be paid for by the Municipality of Anchorage. The Contractor shall be responsible for scheduling special inspections sufficiently in advance of when needed and assuring that the work is ready to be inspected when the inspector is scheduled to visit. The Municipality of Anchorage will not pay for re-inspections caused by the Contractor's failure to be prepared for an inspection scheduled by the Contractor.

EQUAL EMPLOYMENT OPPORTUNITY SPECIAL PROVISIONS

CONTRACT COMPLIANCE SPECIFICATIONS

Every municipal contract shall include language substantially the same as the following: The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, national origin, ancestry, age, sex, sexual orientation, gender identity, marital status, or physical or mental disability. The contract will comply with all laws concerning the prohibition of discrimination including, but not limited to, Title 5 and Title 7 of the Anchorage Municipal Code.

Every municipal contract shall state, in all solicitations or advertisements for employees to work under the contract, that all qualified applicants will receive consideration for employment without regard to race, color, religion, national origin, ancestry, age, sex, sexual orientation, gender identity, marital status, or physical or mental disability.

Laborers' & Mechanics' Minimum Rates of Pay

Title 36. Public Contracts AS 36.05 & AS 36.10 Wage & Hour Administration Pamphlet No. 600 (Pamphlet 600) is hereby incorporated in its entirety. Pamphlet 600 is available for free download at http://www.labor.state.ak.us/lss/forms/pam600.pdf
The Municipality of Anchorage will include a paper copy of the wage rates in the signed Contract.

SECTION 01 10 00 – SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Municipality of Anchorage Standard Specifications – Buildings (MASSB), apply to this Section.

1.2 SECTION INCLUDES

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Coordination with occupants.
5. Work restrictions.
6. Specification and drawing conventions.

1.3 RELATED SECTIONS

A. Related Sections include the following:

1. Divisions 02 through 31 Sections for specific requirements and scheduling of installation.

1.4 DEFINITIONS

A. Contractor: The individual, firm, corporation, partnership, or joint venture executing the Contract and performing the Work under the terms of the Contract Documents.

1.5 PROJECT INFORMATION

A. Project Identification: **MOA – PERFORMING ARTS CENTER ELEVATOR MODERNIZATION**

1. Project Location: Anchorage, Alaska

B. Owner: Municipality of Anchorage.

1. Owner's Representative: Stanford Longan – MOA Project Manager for Capital Projects

C. Architect: Burkhart Croft Architects, LLC.

D. Elevator Consulting Group: Lerch Bates Inc.

1.6 WORK COVERED BY CONTRACT DOCUMENTS

A. Work of this project includes modernization of the freight elevator at the Performing Arts Center (PAC). Also included is Architectural, Mechanical and Electrical work as indicated in the Documents to support the modernization and to correct code deficiencies.

B. Provide all labor, engineering, tools, transportation, services, supervision, materials, and equipment necessary for and incidental to satisfactory completion of required work as indicated in Contract Documents.

C. Provide all required staging, hoisting, and movement of new equipment, reused equipment, or removal of existing equipment.

D. Prime contracts are defined below, and each is recognized to be a major part of required work to be performed concurrently in close coordination with work of other Contractors.

1. This Contract: Elevator Modernization. Include associated work specified in Section 01 90 00.

E. Scope of Contract includes, but is not limited to, the following:

1. Coordination, scheduling, and management of work of component suppliers and subcontractors.

2. Modernize or furnish and install equipment as specified utilizing existing and/or modified hoistway and machine room.

3. Specific item of required work which cannot be determined to be included in another contract is thereby determined to be included in prime contract.

4. Coordinating with and assisting electrical contractor with running LAN cabling in hoistway moving duct to the monitoring equipment compartment in the machine room. Elevator contractor to coordinate with electrical contractor to install all required wiring/cabling for a complete system. Include in the base bid the required time to assist with LAN cable installation. No additional fees will be accepted for coordination and assisting with cable installation by the electrical contractor.

1.7 PRIME CONTRACTOR'S DUTIES

A. Prime Contractor's duties include the following:

1. Provide and pay for labor, materials and equipment, tools, construction equipment and machinery, and other facilities and services necessary for proper execution and completion of required work.
2. Pay for legally required sales, consumer, and state remodel taxes.
3. Secure and pay for required permits, fees, and licenses necessary for proper execution and completion of required work, as applicable at time of quotation due date.
4. Give required notices.
5. Comply with codes, ordinances, rules, regulations, orders, and other legal requirements of public authorities which bear on performance of required work.
6. Promptly submit written notice to Consultant of observed variance of Contract Documents from legal requirements.
7. Enforce strict discipline and good order among employees. Do not employ persons unskilled in assigned task.
8. Prime Contractor can delegate actual work associated with the above item to one of their subcontractors but will be responsible for all items from a contractual standpoint.

1.8 WORK UNDER SEPARATE CONTRACTS

A. The Owner reserves the right to issue additional separate contracts for work in the project area. If separate contracts are executed, Contractor shall cooperate fully with separate contractors so work of those contracts may be carried out smoothly, without interfering with or delaying work under this Contract or other contracts. Contractor shall coordinate the work of this Contract with work performed under separate contracts.

1.9 ACCESS TO SITE

A. General: Contractor shall have unlimited use of Project site for construction operations throughout the course of this contract.

B. Contract Limits: Contractor shall work only in areas designated in Drawings.

C. Use of Site: Limit use of Project site to areas indicated in Drawings. Do not disturb portions of Project site beyond areas shown, or where actual Work is to be performed.

1. Driveways, Walkways and Entrances: Keep driveways and loading areas clear and available to Owner, station personnel, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
2. Do not load structure with weight that will endanger structure. Coordinate with Owner.
3. Assume full responsibility for protection and safekeeping of tools and products stored on or off premises.
4. Move stored products which interfere with operations of building or the operations of other trades.
5. Obtain and pay for use of additional storage or work areas needed for operations.

1.10 CONCURRENT MODERNIZATION WORK AND BUILDING OPERATION

A. This project is a major elevator modernization in an existing building which is open for public business and will continue to operate throughout all phases of required work. It is essential that Contractor give special attention and priority to all matters concerning project safety, protection from dust and loose materials, reduction of noise level, protection from water and air infiltration into building, and maintenance of neat, sightly conditions in and around work areas inside and outside of building. Packaging, scrap materials, and demolition debris shall be promptly removed from building and site on a daily basis.

B. At all times, Contractor shall provide clearly visible warning and directions signs, barricades, temporary lighting, overhead protection, and hazard-free walking surfaces throughout public areas. At all times, special attention must be given to building entrances, exits, and proper safe exiting through work areas as required by law.

C. Contractor shall consult Owner and other Contractors to establish and maintain safe temporary routes including, but not limited to, proper barricades, walking surfaces, lighting, fire protection, exiting, warning and directional signs, and general protection of persons from all hazards in accordance with OSHA Standards due wholly or partially to its operations.

1.11 COORDINATION WITH OCCUPANTS

A. Owner Occupancy: Personnel will need access to the uncovered storage during the entire contract period. Cooperate with Owner and personnel during construction operations to minimize conflicts and facilitate use. Perform the Work so as not to interfere with day-to-day operations.

1.12 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets and other requirements of authorities having jurisdiction.

B. Controlled Substances: Use controlled substances on the Project site is not permitted.

1.13 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the CSI “MasterFormat 2010” numbering system.

1. Section Identification: The specifications use section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are

not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of sections in the Contract Documents.

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. Imperative mood and streamlined language are generally used in the Specifications. 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.
2. Specification requirements are directed to the Contractor unless specifically stated otherwise. Contractor is responsible to coordinate with sub-contractors to ensure requirements are met.
3. The following definitions apply to all specification sections:

   a. Furnish: Supply and deliver to the project, including the cost to supply and deliver.
   b. Install: Build into the work, ready to use in complete, finished and operable system, including the cost to install.
   c. Provide: Furnish and Install for a complete, finished and operable system.

C. Contract Documents: Drawings and specifications are complementary and inter-dependent. What is required by one shall be as required by all. Work identified in Drawings and specifications is not separated by trade, material group or sub-contractor scope, or directed to any party other than the Contractor. Contractor, Sub-Contractors, and Sub-sub-contractors shall familiarize themselves with all Drawings, Specifications and other Contract Documents to identify all Work requirements.

D. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

E. Drawing Coordination: Requirements for materials and products identified on the Drawings are described in detail in the Specifications. One or more of the following are used on the Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings.

PRODUCTS (Not Used)

EXECUTION (Not Used)

END OF SECTION 01 00 00

SECTION 01 33 00 – SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Municipality of Anchorage Standard Specifications – Buildings (MASSB), apply to this Section.

1.2 SUBMITTALS

A. Within sixty calendar days after award of contract and before beginning equipment fabrication, submit shop drawings, and required material samples for review. Allow thirty days for response to initial submittal.
   1. Scaled or Fully Dimensioned Layout: Plan of pit, hoistway, and machine room indicating equipment arrangement, elevation section of hoistway, details of car enclosure, and car/hall signal fixtures.
   2. Design Information: Indicate equipment lists, reactions, and design information on lay-outs.
   3. Power Confirmation Information: Design for existing conditions.
   4. Fixtures: Cuts, samples, or shop drawings.
   5. Finish Material: Submit 3" x 12" samples of actual finished material for review of color, pattern, and texture. Compliance with other requirements is the exclusive responsibility of the Contractor. Include, if requested, signal fixtures, lights, graphics, Braille plates, and detail of mounting provisions.
   6. Design Information: Provide calculations verifying the following:
      a. Adequacy of existing electrical provisions.
      b. Machine room heat emissions in B.T.U.
      c. Adequacy of existing car platform structure for intended loading.
      d. Adequacy of plunger wall thickness for intended loading.
   7. Written Maintenance Control Program (MCP) specifically designed for the equipment included under this contract. Include any unique or product specific procedures or methods required to inspect or to test the equipment. In addition, identify weekly, bi-weekly, monthly, quarterly, and annual maintenance procedures, including statutory and other required equipment tests.

B. Submittal review shall not be construed as an indication that submittal is correct or suitable, or that the work represented by submittal complies with the Contract Documents. Compliance with Contract Documents, code requirements, dimensions, fit, and interface with other work is Contractor’s responsibility.

C. Acknowledge and/or respond to review comments within fourteen calendar days of return. Promptly incorporate required changes due to inaccurate data or incomplete definition so that delivery and installation schedules are not affected. Identify and cloud drawing revisions, in-

cluding Contractor elective revisions on each re-submittal. Contractor's revision response time is not justification for equipment delivery or installation delay.

1.3 FINAL CONTRACT DOCUMENTS

A. See Section 01 70 00, Closeout Procedures.

PRODUCTS (Not Used)

EXECUTION (Not Used)

END OF SECTION 01 33 00

SECTION 01 35 00 – PROJECT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Municipality of Anchorage Standard Specifications – Buildings (MASSB), apply to this Section.

1.2 APPLICABLE CODES

A. Compliance with Regulatory Agencies: Comply with most stringent applicable provisions of following codes, laws, and/or authorities, including revisions and changes in effect:
   1. Safety Code for Elevators and Escalators, ASME A17.1.
   2. Guide for Inspection of Elevators, Escalators, and Moving Walks, ASME A17.2.
   3. Elevator and Escalator Electrical Equipment, ASME A17.5.
   4. National Electrical Code, NFPA 70.
   5. Americans with Disabilities Act, ADA.
   6. Local Fire Authority.
   7. Requirements of IBC and all other codes, ordinances, and laws applicable within the governing jurisdiction.
   8. Life Safety Code, NFPA 101.
   9. Uniform Federal Accessibility Standard, UFAS.

1.3 STAGING AREA

A. An equipment staging area will be available for use by Contractor. Contractor shall restrict usage to area designated and shall notify Owner/Property Management prior to storing of any large equipment which will impose heavy concentrated loading on floor area. Do not store such equipment until approval is received.

1.4 OCCUPANCY AND WORK BY OTHERS

A. Contractor expressly affirms Owner’s rights to let other contracts and employ other Contractors in connection with required work. Contractor will afford other Contractors and their workmen reasonable opportunity for introduction and storage of materials and equipment, for execution of their work and will properly connect and coordinate his work with theirs. Contractor will also incorporate comparable provisions in all its subcontracts.

B. Contractor declares that other Contractors employed by Owner on basis of separate contracts may proceed at such times as necessary to install items of work required by Owner.

C. Contractor declares that it will cooperate with other Contractors employed by Owner and, in addition to other coordination and expediting efforts, will coordinate their work by written notices regarding necessity of such work to be done on or before certain dates.

D. Contractor declares that it is responsible for review, stamped, and signed approval of all shop drawings for required work.

E. Contractor hereby declares that content of foregoing paragraphs and influence they may have on project:
   1. Shall not cause a change in stipulated Contract Sum.
   2. Shall not cause a change in Construction Time Schedule

PRODUCTS (Not Used)

EXECUTION (Not Used)

END OF SECTION 01 35 00

SECTION 01 60 00 – PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Municipality of Anchorage Standard Specifications – Buildings (MASSB), apply to this Section.

1.2 SITE CONDITION INSPECTION

A. Prior to beginning installation of equipment, examine hoistway and machine room areas. Verify no irregularities exist which affect execution of work specified.

B. Do not proceed with installation until work in place conforms to project requirements.

1.3 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver material in Contractor's original, unopened protective packaging.

B. Store material in original protective packaging. Prevent soiling, physical damage, or moisture damage.

C. Protect equipment and exposed finishes from damage and stains during transportation, erection, and construction.

D. Allocate available site storage areas and coordinate their use with Owner and other Contractors.

E. Provide suitable temporary weather-tight storage facilities as may be required for materials which will be stored in the open.

1.4 INSTALLATION REQUIREMENTS

A. Install all equipment in accordance with Contractor's instructions, referenced codes, specification, and approved submittals.

B. Install machine room equipment with clearances in accordance with referenced codes and specification.

C. Install all equipment so it may be easily removed for maintenance and repair.

D. Install all equipment for ease of maintenance.

E. Install all equipment to afford maximum accessibility, safety, and continuity of operation.

F. Remove oil, grease, scale, and other foreign matter from the following equipment and apply one coat of field-applied machinery enamel.
   1. All exposed equipment and metal work installed as part of this work which does not have architectural finish.
   2. Machine room equipment, hoistway equipment including guide rail brackets and pit equipment.
   3. Hoistway equipment including guide rails, guide rail brackets, and pit equipment.
   4. Neatly touch up damaged factory-painted surfaces with original paint color. Protect machine-finish surfaces against corrosion.

1.5 MANUFACTURER'S NAMEPLATES

A. Manufacturer's name plates and other identifying markings shall not be affixed on surfaces exposed to public view. This requirement does not apply to Underwriter's Laboratories and code required labels.

B. Each major component of mechanical and electrical equipment shall have identification plate with the Manufacturer's name, address, model number, rating, and any other information required by governing codes.

1.6 COLORS OF FACTORY-FINISHED EQUIPMENT

A. All colors will be selected from the Manufacturer's standard range unless custom colors are specified herein.

B. Submit samples of all standard colors available and/or specified custom colors for review and approval. See Section 01 30 00, Submittals

C. Submit samples of all specified architectural metals specified for review and approval. See Section 01 30 00, Submittals.

1.7 MATERIALS AND FINISHES

A. Steel:
   1. Sheet Steel (Furniture Steel for Exposed Work): Stretcher-leveled, cold-rolled, commercial quality carbon steel, complying with ASTM A366, matte finish.
   2. Sheet Steel (for Unexposed Work): Hot-rolled, commercial quality carbon steel, pickled and oiled, complying with ASTM A568/A568M-03.
   3. Structural Steel Shapes and Plates: ASTM A36.

B. Stainless Steel: Type 302, 304, or 441 complying with ASTM A240, with standard tempers and hardness required for fabrication, strength, and durability. Apply mechanical finish on fabricated work in the locations shown or specified, Federal Standard and NAAMM nomenclature, with texture and reflectivity required to match Architect's sample. Protect with adhesive paper covering.
   1. No. 4 Satin: Directional polish finish. Graining directions as shown or, if not shown, in longest dimension.

2. No. 8 Mirror: Reflective polish finish with no visible graining.
3. Textured: 5WL as manufactured by Rigidized Metals or Windsor pattern 5-SM as manufactured by Rimex Metals or approved equal with .050 inches mean pattern depth with bright directional polish (satin finish).
4. Burnished: Non-directional, random abrasion pattern.

C. Aluminum: Extrusions per ASTM B221; sheet and plate per ASTM B209.

D. Plastic Laminate: ASTM E84 Class A and NEMA LD3.1, Fire-Rated Grade (GP-50), Type 7, 0.050" ±.005" thick, color and texture as follows:
1. Exposed Surfaces: Color and texture selected by Architect.
2. Concealed Surfaces: Contractor's standard color and finish.

E. Fire-Retardant Treated Particle Board Panels: Minimum 3/4" thick backup for natural finished wood and plastic laminate veneered panels, edged and faced as shown, provided with suitable anti-warp backing; meet ASTM E84 Class "I" rating with a flame-spread rating of 25 or less, registered with local authorities for elevator finish materials.

F. Paint: Clean exposed metal parts and assemblies of oil, grease, scale, and other foreign matter and factory paint one shop coat of standard rust-resistant primer. After erection, provide one finish coat of industrial enamel paint. Galvanized metal need not be painted.

G. Prime Finish: Clean all metal surfaces receiving a baked enamel paint finish of oil, grease, and scale. Apply one coat of rust-resistant primer followed by a filler coat over uneven surfaces. Sand smooth and apply final coat of primer.

H. Baked Enamel Finish: Prime finish per above. Unless specified "prime finish" only, apply and bake three additional coats of enamel in the selected solid color.

I. Entrance Field Paint: Clean all surfaces of dirt and grease. Sand and finish surfaces as necessary to remove pits and scratches and prepare surface for painting. Apply filler to ensure smooth surface, sand and apply one coat of electrostatic enamel in the selected solid color.

J. Entrance Support Equipment within Hoistway: Include strut angles, headers, sill support angles, fascia, hanger covers, etc. Clean, remove, and check for corrosive activity. Replace components that exhibit severe deterioration. Tighten all fastenings. Repaint exposed surfaces with two coats of rust preventive primer.

PRODUCTS (Not Used)

EXECUTION (Not Used)

END OF SECTION 01 60 00

SECTION 01 70 00 – EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Municipality of Anchorage Standard Specifications – Buildings (MASSB), apply to this Section.

1.2 FINAL CLEANING

A. As a minimum:
   1. Elevator hoistways and all equipment therein shall be cleaned and left free of rust, filings, welding slag, rubbish, loose plaster, mortar drippings, extraneous construction materials, dirt, and dust. Include walls, building beams, sill ledges, and hoistway divider beams.
   2. Care shall be taken by workpersons not to mark, soil, or otherwise deface existing or new surfaces. Clean and restore such surfaces to their original condition.
   3. Clean down surfaces and areas which require final painting and finishing work. Cleaning includes removal of rubbish, broom cleaning of floors, removal of any loose plaster or mortar, dust, and other extraneous materials from finish surfaces, and surfaces which will remain visible after the work is complete.

1.3 CONSULTANT'S FINAL OBSERVATION AND REVIEW REQUIREMENTS

A. Review procedure shall apply for individual elevators, portions of groups of elevators and completed groups of elevators accepted on an interim basis, or elevators and groups of elevators completed, accepted, and placed in operation.

B. Contractor shall perform review and evaluation of all aspects of its work prior to requesting Consultant's final review. Work shall be considered ready for Consultant's final contract compliance review when all Contractor's tests are complete and all elements of work or a designated portion thereof are in place, and elevator or group of elevators are deemed ready for service as intended.

C. Furnish labor, materials, and equipment necessary for Consultant's review. Notify Consultant five working days in advance when ready for final review of elevator or group of elevators.

D. Consultant's written list of observed deficiencies of materials, equipment, and operating systems will be submitted to Contractor for corrective action. Consultant's review shall include as a minimum:
   1. Workmanship and equipment compliance with Contract Documents.
   2. Contract speed, capacity, floor-to-floor, and door performance comply with Contract Documents.
   3. Performance of following is satisfactory:

a. Starting, accelerating, running.
b. Decelerating and stopping accuracy.
c. Door operation and closing force.
d. Equipment noise levels.
e. Signal fixture utility.
f. Overall ride quality.
g. Performance of door control devices.
h. Operations of emergency two-way communication device.
i. Operations of firefighters' service.

4. Test Results:
   a. In all test conditions, obtain specified contract speed, performance times, stopping accuracy without re-leveling, and ride quality to satisfaction of Owner and Consultant. Tests shall be conducted under both no load and full load condition.
   b. Temperature rise in motor windings limited to 50° Celsius above ambient. A full-capacity one-hour running test, stopping at each floor for ten seconds in up and down directions, may be required.

E. Performance Guarantee: Should Consultant's review identify defects, poor workmanship, variance, or noncompliance with requirements of specified codes and/or ordinances, or variance or noncompliance with the requirements of Contract Documents, Contractor shall complete corrective work in an expedient manner to satisfaction of Owner and Consultant at no cost as follows:
   1. Replace equipment that does not meet code or Contract Document requirements.
   2. Perform work and furnish labor, materials, and equipment necessary to meet specified operation and performance.
   3. Perform retesting required by Governing Code Authority, Owner, and Consultant.

F. A follow-up final contract compliance review shall be performed by Consultant after notification by Contractor that all deficiencies have been corrected. Provide Consultant with copies of the initial deficiency report marked to indicate items which Contractor considers complete.

1.4 OWNER'S INFORMATION

A. Provide three sets of neatly bound written information necessary for proper maintenance and adjustment of equipment within thirty days following final acceptance. Final retention will be withheld until data is received by Owner and reviewed by Consultant. Include the following as minimums:
   1. Straight-line wiring diagrams of "as-installed" elevator circuits with index of location and function of components. Provide one set reproducible master. Mount one set wiring diagrams on panels, racked, or similarly protected, in elevator machine room. Provide remaining set rolled and in a protective drawing tube. Maintain all drawing sets with addition of all subsequent changes. These diagrams are Owner's property.
   2. Written Maintenance Control Program (MCP) specifically designed for the equipment included under this contract. Include any unique or product specific procedures or methods required to inspect or to test the equipment. In addition, identify weekly, bi-weekly, monthly, quarterly, and annual maintenance procedures, including statutory and other required equipment tests.

3. Provide any necessary interface cards required for equipment maintenance, code mandated testing, and troubleshooting.
4. Lubrication instructions including recommended grade of lubricants.
5. Parts catalogs for all replaceable parts including ordering forms and instructions.
6. Four sets of keys for all switches and control features properly tagged and marked.
7. Neatly bound instructions explaining all operating features including all apparatus in the car and lobby control panels.
8. Neatly bound maintenance and adjustment instructions explaining areas to be addressed, methods and procedures to be used, and specified tolerances to be maintained for all equipment.
9. Diagnostic equipment, complete with access codes, adjusters' manuals and set-up manuals for adjustment, diagnosis and troubleshooting of elevator system, and performance of routine safety tests.

B. Acceptance of such records by Owner/Consultant shall not be a waiver of any Contractor deviation from Contract Documents or shop drawings or in any way relieve Contractor from his responsibility to perform work in accordance with Contract Documents.

PRODUCTS (Not Used)

EXECUTION (Not Used)

END OF SECTION 01 70 00

SECTION 01 80 00 – MAINTENANCE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Municipality of Anchorage Standard Specifications – Buildings (MASSB), apply to this Section.

1.2 INTERIM MAINTENANCE

A. No interim maintenance. Maintenance of this unit will remain with the current service provider until it is ready to be removed from service.

1.3 WARRANTY MAINTENANCE

A. Provide preventive maintenance and include 24-hour emergency callback service for one year commencing on date of final acceptance by Owner. Systematically examine, adjust, clean, and lubricate all equipment. Repair or replace defective parts using parts produced by the Contractor of installed equipment. Maintain elevator machine room, hoistway, and pit in clean condition.

B. Use competent personnel, acceptable to the Owner, supervised and employed by Contractor.

C. The warranty maintenance period specified in Item 1.2 A. above shall be extended one month for each three-month period in which equipment related failures average more than .25 per unit per month.

D. Owner retains the option to delete cost of warranty maintenance from new equipment contract and remit twelve equal installments directly to Contractor during period in which maintenance is being performed.

1.4 CONTRACT PREVENTIVE MAINTENANCE

A. Maintenance of this unit will return to the current provider under its current agreement at the completion of the 12 month warranty period.

PRODUCTS (Not Used)

EXECUTION (Not Used)

END OF SECTION 01 80 00

SECTION 01 90 00 – RELATED WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Municipality of Anchorage Standard Specifications – Buildings (MASSB), apply to this Section.

1.2 RELATED WORK BY CONTRACTOR

A. Hoistway and Pit:
   1. Cutting and patching walls and floors.
   2. Opening in hoistway wall or pit wall for hydraulic piping.
   3. Pit access. Retractable ladder if provided shall include an electrical contact conforming to ASME A17.1, Rule 2.2.2.4.2.7.
   4. Waterproof pit. Indirect waste drain or sump with flush grate and pump. Sump pump/drain capacity minimum 3,000 gallons per hour.
   5. Protect car enclosure, hoistway entrance assemblies, and special metal finishes from damage.
   6. Provide new code compliant key lock box.
   7. Provide heat detector(s) next to each sprinkler head.

B. Machine Room and Machinery Spaces:
   1. Remove machine room door and frame.
   2. Provide new Self-closing and locking access door if required. Include signage: “Elevator Machine Room” and “Authorized Personnel Only.” Install door to swing out to meet code requirements.
   3. Ventilation and heating. Maintain minimum temperature of 55° F, maximum 90° F. Maintain maximum 80% relative humidity, non-condensing.
   4. Paint walls, floor, and ceiling.
   5. Class “ABC” fire extinguisher in each elevator machine room.
   6. Remove/relocate foreign piping
   7. All necessary work associated with getting equipment in and out of machine room. Including but not limited to: Engineering, cutting, patching, and painting.

C. Electrical Service, Conductors, and Devices:
   1. LED Lighting and GFCI convenience outlets in pit, and machine room. Provide one additional non-GFCI convenience outlet in pit for sump pump.
   2. Three-phase mainline copper power feeder with true earthen grounding to terminals of each elevator controller in the machine room with protected, lockable “open” disconnecting means with auxiliary contacts to allow Elevator Contractor to electronically interlock battery power lowering unit within code required range of the strike side of the machine room door.

3. Single-phase copper power feeder to elevator controller for car lighting and exhaust blower with individual protected, lockable “open” disconnecting means located in machine room.
4. Pit lighting: Single-phase copper power feeder for lighting in the elevator pit. Guarded fixtures to provide a minimum of 10 foot-candles coverage.
5. Machine room lighting: Provide new guarded LED fixtures with a minimum of 19 foot-candles average illumination. Provide toggle switch adjacent to strike side of machine room door.
6. Verify existing hallway lighting meets current code requirements. If the lighting does not, add LED fixtures to provide 10 foot-candles average illumination measured at the threshold with doors closed. Lighting shall be always on, unswitched and no occupancy sensor.
7. Emergency telephone line to elevator control panel in elevator machine room.
8. Fire alarm initiating devices in each elevator lobby and machine room to initiate firefighters’ return feature. Device at top of hoistway if sprinklered. Provide alarm initiating signal wiring from hoistway or machine room connection point to elevator controller terminals. Device in machine room and at top of hoistway to provide signal for general alarm and discrete signal for Phase II firefighters’ operation.
9. Means to automatically disconnect power to elevator pump unit and controller prior to activation of machine room fire sprinkler system and/or hoistway fire sprinkler system. Manual shut-off means shall be located outside bounds of machine room. (Manual shut-off to be provided if required by code)
10. Conduit from the hoistway to the firefighters' control room and/or main control console. Coordinate size, number, and location of conduits with Elevator Contractor.
11. When sprinklers are provided in the hoistway all electrical equipment located less than 4'-0" above the pit floor shall be identified for use in wet locations. Exception: seismic protection devices.
12. Single-phase power feeder to elevator intercom amplifier in the elevator machine room.
13. Three-phase power feeder to freight elevator power door controller in machine room with protected, lockable “open” disconnecting means.

D. Standby Power Provision (Emergency Power):
1. Standby power of normal voltage characteristics via normal electrical feeders to run elevator at full-contract car speed and capacity.
2. Conductor from auxiliary form “C” dry contacts, located in the standby power transfer switch to elevator control panel. Provide a time delay of 30-45 seconds for pre-transfer signal in either direction.
3. Standby single-phase power to elevator controller for car lighting, exhaust blower, emergency signaling device, and intercom amplifier.
4. Standby power to machine room and pit lighting.
5. Standby power to machine room ventilation or air conditioning.
6. Standby power to emergency communications devices.

PRODUCTS (Not Used)

EXECUTION (Not Used)

END OF SECTION 01 90 00

SECTION 02 41 19 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Municipality of Anchorage Standard Specifications – Buildings (MASSB), apply to this Section.

1.2 SECTION INCLUDES

A. This Section includes:

1. Demolition and removal of interior and exterior finishes and building elements.
2. Salvage of existing items to be reused or recycled.

1.3 RELATED SECTIONS:

A. Related Sections include the following:

1. SECTION 01 10 00 – SUMMARY, for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.

1.4 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: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner.

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

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

1.5 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.6 PREINSTALLATION MEETINGS

A. Pre-demolition Conference: Conduct conference at Project site.

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review structural load limitations of existing structure.
3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
5. Review areas where existing construction is to remain and requires protection.

1.7 INFORMATIONAL SUBMITTALS

A. Schedule of Selective Demolition Activities.

B. Pre-demolition Photographs or Video: Submit before Work begins.

C. Warranties: Documentation indicated that existing warranties are still in effect after completion of selective demolition.

1.8 FIELD CONDITIONS

A. Portions of building immediately adjacent to selective demolition area will be occupied by the building tenants. Conduct selective demolition so current operations will not be disrupted.

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

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. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

E. 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.

1.9 WARRANTY

A. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

PART 2 - PRODUCTS

2.1 PEFORMANCE REQUIREMENTS

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

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.

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

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.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

1. Comply with requirements for existing services/systems interruptions specified in Section 01 10 00 "Summary."

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Building manager will arrange to shut off indicated services/systems when requested by Contractor.
2. Arrange to shut off indicated utilities with utility companies.
3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.

    a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
    b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
    c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
    d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
    e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

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.

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

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.

3. Cover and protect furniture, furnishings, and equipment that have not been removed.

3.4 SELECTIVE DEMOLITION, GENERAL

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. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
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.

B. 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. Protect items from damage during transport and storage.

C. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
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.

D. 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 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 reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

3.7 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 02 41 19

SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Municipality of Anchorage Standard Specifications (MASS), General and Supplementary Conditions apply to this Section.

1.2 SECTION INCLUDES

A. This Section Includes the following:

1. Joint sealants.

1.3 RELATED SECTIONS

A. Related Sections include the following:

1. SECTION 08 11 13 – HOLLOW METAL DOORS AND FRAMES, for hollow metal door frames.

1.4 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

D. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.

F. Warranties: Sample of special warranties

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.

1.6 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.7 WARRANTY

A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be non-staining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

C. Single-Component Polyurethane Sealant: For use at exterior siding, roofing, and flashing installations.

1. Products:

a. Permathane SM7100/7108, by Schnee-Morehead, or equal.

2. Type and Grade: S (single component) and NS (non-sag).
3. Class: 25.
4. Use Related to Exposure: NT (non-traffic).
5. Uses Related to Joint Substrates: M, G, A, and O.

D. Single-Component Neutral-Curing Silicone Sealant: For interior applications

1. Products:

a. Dow Corning Corporation; 790.
b. GE Silicones; SilPruf LM SCS2700.
c. GE Silicones; SilPruf SCS2000.
d. Sonneborn, Division of ChemRex Inc.; Omniseal.
e. Or equal.

2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 100/50.
4. Use Related to Exposure: NT (non-traffic).
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
6. Stain-Test-Response Characteristics: Non-staining to porous substrates per ASTM C 1248.

E. Single-Component Mildew-Resistant Neutral-Curing Silicone Sealant: For interior applications subject to exposure to moisture.

1. Products:

a. Pecora Corporation; 898, or equal.

2. Type and Grade: S (single component) and NS (non-sag).
3. Class: 25.
4. Use Related to Exposure: NT (non-traffic).
5. Uses Related to Joint Substrates: G, A, and, as applicable to joint substrates indicated, O.

2.3 JOINT SEALANT BACKING

A. General: Provide sealant backings of material that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, type, size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.4 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Non-porous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Non-staining, non-absorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Non-sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.

    a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 07 92 00

SECTION 08 11 13 – HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Municipality of Anchorage Standard Specifications (MASS), General and Supplementary Conditions apply to this Section.

1.2 SECTION INCLUDES

A. This Section includes the following:

1. Maximum-Duty hollow metal doors and frames, as indicated on Drawings.

1.3 RELATED SECTIONS

A. Related Sections include the following:

1. SECTION 08 71 00 – DOOR HARDWARE, for door hardware for hollow metal doors.
2. SECTION 09 91 23 – INTERIOR PAINTING, for painting hollow metal doors and frames.

1.4 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

B. Standard Hollow Metal Work: Hollow metal work fabricated according to ANSI/SDI A250.8.

1.5 SUBMITTALS

A. Field Verification Report: Provide schedule of field-verified door and frame components, organized by door numbers indicated in Drawings. Confirm suitable condition and function of existing doors and frames scheduled for re-use.

B. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, fire-resistance rating, temperature-rise ratings, and finishes.

C. Shop Drawings: Include the following:

1. Elevations of each door design.
2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of each different wall opening condition.
6. Details of anchorages, joints, field splices, and connections.
7. Details of accessories.
8. Details of moldings, removable stops, and glazing.
9. Details of conduit and preparations for power, signal, and control systems.

D. Schedule: Provide a schedule of hollow metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with door hardware schedule.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of hollow metal door and frame assembly.

1.6 QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal work from single source from single manufacturer.

B. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UBC Standard 7-2.

C. Preinstallation Conference: Conduct conference at Project site.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch- high wood blocking. Do not store in a manner that traps excess humidity.

1. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

1.8 COORDINATION

A. Electric Functions: Coordinate requirements of other sections and trades related to security and access control system.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Amweld Building Products, LLC.
2. Ceco Door Products; an Assa Abloy Group company.
3. Curries Company; an Assa Abloy Group company.

2.2 DOORS AND FRAMES

A. Construct doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Maximum-Duty Doors and Frames: SDI A250.8, Performance Level 4.

1. Physical Performance: Level A according to SDI A250.4.
2. Doors:

    a. Type: As indicated in the Door and Frame Schedule.
    b. Thickness: 1-3/4 inches
    c. Face: Metallic-coated steel sheet, minimum thickness of 0.067 inch, with minimum A40 coating.
    d. Edge Construction: Model 2, Seamless.
    e. Core: Polyurethane.
        1) Fire Door Core: As required to provide fire-protection ratings indicated.
        2) Thermal-Rated (Insulated) Doors: Where indicated, provide doors fabricated with thermal-resistance value (R-value) of not less than 10 deg F x h x sq. ft./Btu when tested according to ASTM C518 or 2.9 deg F x h x sq. ft./Btu when tested according to ASTM C1363.
            a) Locations: Vestibule doors, and interior doors where indicated.

3. Frames: Metallic-coated steel sheet, minimum thickness of 0.067 inch, with minimum A40 coating.

    a. Construction: Full profile welded.
    b. Exposed Finish: Prime.

2.3 FRAME ANCHORS

A. Jamb Anchors:

1. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.067 inch thick.

B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.067 inch.

2.4 STOPS AND MOLDINGS

A. Moldings for Glazed Lites in Doors: Minimum 0.032 inch thick, fabricated from same material as door face sheet in which they are installed.

B. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch high unless otherwise indicated.

C. Loose Stops for Glazed Lites in Frames: Minimum 0.032 inch thick, fabricated from same material as frames in which they are installed.

2.5 ACCESSORIES

A. Mullions and Transom Bars: Join to adjacent members by welding.

2.6 FABRICATION

A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

1. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.

B. Hollow Metal Doors:

1. Vertical Edges for Single-Acting Doors: Provide beveled or square edges at manufacturer's discretion.
2. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets.
3. Bottom Edge Closures: Close bottom edges of doors where required for attachment of weather stripping with end closures or channels of same material as face sheets.
4. Glazed Lites: Factory cut openings in doors.

5. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.

C. Hollow Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

1. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
3. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
4. Jamb Anchors: Provide number and spacing of anchors as follows:

    a. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

        1) Four anchors per jamb from 60 to 90 inches high.

5. Head Anchors: Two anchors, minimum per head for frames.

6. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers as follows. Keep holes clear during construction.

    a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.

D. Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold- or hot-rolled steel sheet.

E. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Section 08 7 10 - Door Hardware.

1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
2. Reinforce doors and frames to receive nontemplated, mortised and surface-mounted door hardware.
3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

F. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.

1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow metal work.
2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
3. Provide fixed frame moldings on secure side of interior doors and frames.
4. Provide loose stops and moldings on inside of hollow metal work.
5. Coordinate rabbet width between fixed and removable stops with type of glazing and type of installation indicated.

2.7 STEEL FINISHES

A. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

C. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness to the following tolerances:

1. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
2. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
3. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
4. Plumbness: Plus or minus 1/16 inch, measured at jambs on a perpendicular line from head to floor.

C. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11.

1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

    a. At fire-protection-rated openings, install frames according to NFPA 80.
    b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
    c. Install frames with removable glazing stops located on secure side of opening.
    d. Install door silencers in frames before grouting.
    e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    f. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
    g. Field apply bituminous coating to backs of frames that are filled with grout containing antifreezing agents.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.

    a. Floor anchors may be set with powder-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.
4. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:

a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Standard Steel Doors:

a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

D. Glazing: Comply with installation requirements in Section 08 80 00 –Glazing and with hollow metal manufacturer's written instructions.

1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

B. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

C. Metallic-Coated Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION 08 11 13

SECTION 08 71 00 – DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Municipality of Anchorage Standard Specifications (MASS), General and Supplementary Conditions apply to this Section.

1.2 SECTION INCLUDES

A. Section includes:

1. Door hardware for swinging doors.

B. Quantities: Quantities listed are for the Contractor's convenience only and are not guaranteed. Items not specifically mentioned, but necessary to complete the work shall be furnished, matching the items specified in quality and finish.

1.3 RELATED SECTIONS

A. Related Sections include the following:

1. SECTION 08 11 13 – HOLLOW METAL DOORS AND FRAMES, for hollow metal doors and frames to receive door hardware specified in this Section.

1.4 REFERENCES

A. Applicable Codes and Standards: Comply with the following codes and standards, current edition at date of bid:

1. ADAAG - Americans with Disabilities Act, “Accessibility Guidelines for Buildings and Facilities”
2. ANSI/BHMA A156.18 - Materials and Finishes
3. ICC/ANSI A117.1 - Accessible and Usable Buildings and Facilities
4. NFPA 80 - Standard for Fire Doors and Windows
5. NFPA 252 - Standard of Fire Tests of Door Assemblies
6. Underwriters Laboratories - Building Materials Directory
7. Underwriters Laboratories Test Standard UL 10C - Positive Pressure Fire Tests of Door Assemblies

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Color Samples: Submit color charts and physical samples of each product requiring color selection.

C. Hardware Schedule: Provide a Finish Hardware Schedule indicating the complete designation of every item required for each door or opening.

1. List each opening individually, under separate heading, in same order as the door schedule. Do not group like or similar doors under a single heading. Do not continue headings on separate pages.
2. Each heading shall indicate opening location, handing, degree of opening, door size, type, fire rating, and Door and Frame material.
3. Indicate product Manufacturer and incorporate cross-reference to symbols used in "Hardware Groups" article.
4. The submittal shall include an index indicating door, heading, page numbers, and locking function of each opening.
5. Include locations for all miscellaneous items.
6. Include cross-reference for abbreviations or symbols used.
7. Schedules in coded or horizontal format are unacceptable.
8. Submittals not conforming to these requirements will be returned without review, for re-submittal. Following is an example of the required format:

SET #12

6	Hinges	FBB191 4 1/2 X 4 1/2 NRP	US32D	ST
1	Flush Bolt (Top Only)	3917-12	626	TR
1	Lockset	45H-7D14M STD 7/8"LTC	630	BE
2	Wall Bumper	1270WX	630	TR
1	Astragal	139 A 84"		NA
2	Door Silencers	1229A	BLACK	TR

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Supplier and Installer.

B. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of door hardware to include in maintenance manuals.

1.8 QUALITY ASSURANCE

A. Supplier Qualifications: Finish hardware shall be supplied by a recognized builders' hardware supplier who has furnished hardware in the same area as the project for a period of not less than five years. Supplier must be a factory authorized, direct, and stocking distributor of the Locksets and Door Closers. The supplier's organization shall include an Architectural Hardware Consultant, certified by the Door and Hardware Institute, to remain available during the course of the work to consult with the Owner's Representative, Architect or Contractor for project hardware requirements and coordination.

B. Installer Qualifications: Installer of products and an employer of workers trained and approved by product manufacturers.

C. Source Limitations: Obtain each type of door hardware from a single manufacturer.

1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

D. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated, provide door hardware rated for use in assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C, unless otherwise indicated.

E. Regulatory Requirements: All finish hardware shall comply with applicable local and/or state current building codes. All finish hardware shall meet the requirements of ADAAG-1992, and ICC/ANSI A117.1 Accessible and Usable Building and Facilities.

F. Product Compliance: Provide only hardware which has been tested and listed by a recognized testing agency for the types and sizes of doors required, and which complies with the requirements of the door and door frame labels. Provide door closers, automatic self-latching bolts, coordinators, gasketing, astragals, or other components if required to conform to label requirements.
1. Address for delivery of keys.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site. Store hardware components in a securely locked location on the project site.

1.10 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

1.11 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware failing in materials or workmanship within specified warranty period.

1. Closers: Thirty years
2. Exit Devices: Five Years
3. Locksets & Cylinders: Life of Building
4. All other Hardware: Two years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Products may be furnished by the manufacturers listed under “Basis of Design” below, or equivalent products of type, grade, design, and function, from manufacturers listed under “Acceptable Substitutions”.

Product	Basis-of-Design	Acceptable Substitutions
Hinges	Stanley (ST)	Bommer, McKinney
Continuous Hinges	Stanley (ST)	Select, ABH
Locksets	Schlage (SCH)	No Substitutions Permitted
Cylinders	BEST (BE)	No Substitutions Permitted
Exit Devices	Von Duprin (VO)	No Substitutions Permitted
Closers	LCN (LCN)	No Substitutions Permitted
Push/Pull Plates	Trimco (TR)	Hager, Rockwood
Protection Plates	Trimco (TR)	Hager, Rockwood
Overhead Stops	ABH (ABH)	Rixson, Glynn Johnson
Door Stops	Trimco (TR)	Hager, Rockwood
Flush Bolts	Trimco (TR)	ABH, Rockwood

Coordinator & Brackets	Trimco (TR)	ABH, Rockwood
Threshold & Gasketing	Pemko (PE)	National Guard, Reese, Zero

2.2 MATERIALS AND FABRICATION

A. Hinges: Shall be Five Knuckle Ball bearing hinges

1. Template screw hole locations
2. Bearings are to be fully hardened.
3. Bearing shell is to be consistent shape with barrel.
4. Minimum of 2 permanently lubricated non-detachable bearings on standard weight hinge and 4 permanently lubricated bearing on heavy weight hinges.
5. Equip with easily seated, non-rising pins.
6. Non Removable Pin screws shall be slotted stainless steel screws.
7. Hinges shall be full polished, front, back and barrel.
8. Hinge pin is to be fully plated.
9. Bearing assembly is to be installed after plating.
10. Sufficient size to allow 180-degree swing of door
11. Furnish five knuckles with flush ball bearings
12. Provide hinge type as listed in schedule.
13. Furnish 3 hinges per leaf to 7 foot 6 inch height. Add one for each additional 30 inches in height or fraction thereof.
14. Tested and approved by BHMA for all applicable ANSI Standards for type, size, function and finish
15. UL10C listed for Fire rated doors.

B. Mortise Type Locks and Latches:

1. Tested and approved by BHMA for ANSI A156.13, Series 1000, Operational Grade 1, Extra-Heavy Duty, Security Grade 2 and be UL10C.
2. Furnish UL or recognized independent laboratory certified mechanical operational testing to 4 million cycles minimum.
3. Provide 9001-Quality Management and 14001-Environmental Management.
4. Fit ANSI A115.1 door preparation
5. Functions and design as indicated in the hardware groups
6. Solid, one-piece, 3/4-inch (19mm) throw, anti-friction latchbolt made of self-lubricating stainless steel
7. Deadbolt functions shall have 1 inch (25mm) throw bolt made of hardened stainless steel
8. Latchbolt and Deadbolt are to extend into the case a minimum of 3/8 inch (9.5mm) when fully extended
9. Auxiliary deadlatch to be made of one piece stainless steel, permanently lubricated
10. Provide sufficient curved strike lip to protect door trim
11. Lever handles must be of forged or cast brass, bronze or stainless steel construction and conform to ANSI A117.1. Levers that contain a hollow cavity are not acceptable
12. Lock shall have self-aligning, thru-bolted trim

13. Levers to operate a roller bearing spindle hub mechanism
14. Mortise cylinders of lock shall have a concealed internal setscrew for securing the cylinder to the lockset. The internal setscrew will be accessible only by removing the core, with the control key, from the cylinder body.
15. Spindle to be designed to prevent forced entry from attacking of lever
16. Provide locksets with 7-pin removable and interchangeable core cylinders
17. Each lever to have independent spring mechanism controlling it
18. Core face must be the same finish as the lockset.

C. Door Closers shall:

1. Tested and approved by BHMA for ANSI 156.4, Grade 1
2. UL10C certified
3. Provide 9001-Quality Management and 14001-Environmental Management.
4. Closer shall have extra-duty arms and knuckles
5. Conform to ANSI 117.1
6. Maximum 2 7/16 inch case projection with non-ferrous cover
7. Separate adjusting valves for closing and latching speed, and backcheck
8. Provide adapter plates, shim spacers and blade stop spacers as required by frame and door conditions
9. Full rack and pinion type closer with 1½“ minimum bore
10. Mount closers on non-public side of door, unless otherwise noted in specification
11. Closers shall be non-handed, non-sized and multi-sized.

D. Over Head Stops: Provide a concealed overhead when a floor or wall stop cannot be used or when listed in the hardware set.

1. Concealed overhead stops shall be heavy duty bronze or stainless steel.

E. as indicated in hardware set. Furnish oval-head countersunk screws to match finish.

F. Kickplates: Provide with four beveled edges ANSI J102, 10 inches high by width less 2 inches on single doors and 1 inch on pairs of doors. Furnish oval-head countersunk screws to match finish.

G. Seals: All seals shall be finished to match adjacent frame color. Seals shall be furnished as listed in schedule. Material shall be UL listed for labeled openings.

H. Weatherstripping: Provide at head and jambs only those units where resilient or flexible seal strip is easily replaceable. Where bar-type weatherstrip is used with parallel arm mounted closers install weatherstrip first.

1. Weatherstrip shall be resilient seal of (Neoprene, Polyurethane, Vinyl, Pile, Nylon Brush, Silicone)
2. UL10C Positive Pressure rated seal set when required.

I. Door Bottoms/Sweeps: Surface mounted or concealed door bottom where listed in the hardware sets.

1. Door seal shall be resilient seal of (Neoprene, Polyurethane, Nylon Brush, Silicone)
2. UL10C Positive Pressure rated seal set when required.

J. Thresholds: Thresholds shall be aluminum beveled type with maximum height of ½" for conformance with ADA requirements. Furnish as specified and per details. Provide fasteners and screws suitable for floor conditions.

K. Silencers: Furnish silencers on all interior frames, 3 for single doors, 2 for pairs. Omit where any type of seals occur.

2.3 FINISH:

A. Designations used in Schedule of Finish Hardware - 3.05, and elsewhere to indicate hardware finishes are those listed in ANSI/BHMA A156.18 including coordination with traditional U.S. finishes shown by certain manufacturers for their products

B. Powder coat door closers to match other hardware, unless otherwise noted.

C. Aluminum items shall be finished to match predominant adjacent material. Seals to coordinate with frame color.

2.4 KEYS AND KEYING:

A. Provide keyed brass construction cores and keys during the construction period. Construction control and operating keys and core shall not be part of the Owner's permanent keying system or furnished in the same keyway (or key section) as the Owner's permanent keying system. Permanent cores and keys will be furnished by the Owner.

2.5 DOOR HARDWARE GROUPS

Finish List

Code	Description
AL	Aluminum
626	Satin Chromium Plated
628	Satin Aluminum, Clear Anodized
630	Satin Stainless Steel
689	Aluminum Painted
BLACK	Black
US32D	Stainless Steel, Dull

Hardware Group

HW-1
INTERIOR DOOR 164

3	HINGES	ST	FBB179 4 1/2 X 4 1/2 US26D
1	CLASSROOM LOCKSET	SCH	ND70PD SFIC 630
1	CORE	BY OWNER	
1	DOOR CLOSER	LCN	4041-EDA
1	OVERHEAD STOP		1020 SERIES
1	SMOKE SEAL	PE	S88D HEAD AND JAMBS
1	DOOR SWEEP	PE	18061 CNB
2	KICK PLATE	TR	K1250 X 630 - 12" X 34" RO

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Blocking: Provide solid blocking for wall mounted components.

C. Fasteners: Check all conditions and use fastening devices as needed to securely anchor all hardware as per manufacturer's published templates. Self-tapping sheet metal screws are not acceptable. Door Closers, Exit Devices, and Surface Overhead Stops shall be mounted with Sex Bolts.

D. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Mounting Heights: Mounting Heights: Mount units at heights as recommended in "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames (2001)" by Doors and Hardware Institute, except as indicated below. Products not specifically covered shall be installed in accordance with the manufacturer templates and instructions.

1. Hinges:

    a. Top Hinge: 7-1/4", Top of frame rabbet to centerline of hinge.
    b. Bottom Hinge: 12-1/4", Bottom of Frame to centerline of hinge
    c. Intermediate Hinges: Centered, equal spacing between top and bottom hinges.

2. Mortise Lock Strikes: 40", bottom of frame to centerline of Strike.
3. Wall Stops: Locate Wall Stops intended for use with Lever Handle Locksets and Exit Devices at the Centerline of the Spindle or Pull.
4. Push/Pulls Sets: 42", bottom of frame to center of Push Bar.

B. Installation: Install each hardware item in compliance with manufacturer's instructions.

1. Cutting and Fitting: Wherever cutting and fitting are required to install hardware surfaces which will be painted or finished at a later time, install each item completely and then remove and store in a secure place. After completion of the finishes, re-install each item.
2. Door and Frame Finishes: Do not install surface-mounted items until finishes have been completed on the substrate.
3. Fire Rated Openings: Comply with NFPA 80.
4. Door Closers: Located to provide the maximum degree of opening that project conditions will allow. Door Closers shall not be used to stop the door, except for models equipped with an integral stop-on-the-arm feature.
5. Overhead Stops: Locate Overhead Stop and Holders to provide the maximum degree of opening that project conditions will allow.
6. Floor Stops: Locate Floors Stops at maximum degree of opening that project conditions will allow. Do not locate Floor Stops where they create a hazardous condition. Stops should be located no more than 1/3 Door width from the latch edge of the Door.
7. Thresholds: Set exterior Thresholds in a bed of butyl rubber sealant in conformance with Division 07 requirements. Remove excess sealant. Caulk edges and joints to exclude moisture.
8. Weatherstrip: Mount and adjust Rigid Jamb Weatherstrip prior to mounting Parallel Arm Door Closers. Weatherstrip shall be installed to provide a continuous seal at head and jambs. Do not notch Weatherstrip for Door Closer shoe. Lower Door Closer Cylinder Assembly ¼" to allow for mounting of Soffit Shoe on top of the Weatherstrip. Provide Parallel Arm 5th hole spacer of increased thickness to allow for revised location.

C. Adjustment: Adjust and check each operating item of hardware and each door to insure proper operation or function of every unit. Replace units, which cannot be adjusted to operate freely and smoothly.

3.3 FINAL ADJUSTMENT

A. Final Adjustment: Wherever hardware installation is made more than one (1) month prior to acceptance or occupancy, make a final check and adjustment of all hardware items during the week prior to acceptance or occupancy. Clean and lubricate operating items as necessary to

restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

B. Door Closer Adjustment: After mechanical systems have been balanced, adjust Door Closers to comply with following ICC/ANSI A117.1 requirements.

1. Closing Speed: With the door open 70 degrees; the door closer shall be adjusted so that the door will take at least three (3) seconds to move to a point where the leading edge of the door is inches three from latching.
2. Opening Force: The maximum force for pushing or pulling a door open shall be as follows: (these forces do not apply to the force required to retract latch bolts or disengage other devices securing the door)

    a. Fire Doors: The minimum opening force allowable by the appropriate administrative authority.
    b. Exterior Doors: 10.0 lbf.
    c. Interior Doors: 5.0 lbf.

C. Adjust backcheck to prevent damage to the closer, hardware, door and frame, and wall.

D. Instruction: Instruct Owner's Personnel in proper adjustment and maintenance of hardware and hardware finishes

3.4 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

END OF SECTION 08 71 00

SECTION 09 91 23 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Municipality of Anchorage Standard Specifications (MASS), General and Supplementary Conditions apply to this Section.

1.2 SECTION INCLUDES

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

1. Steel.
2. Masonry.
3. Gypsum Wallboard.

1.3 RELATED SECTIONS

A. Related Sections include the following:
1. SECTION 08 11 13 – HOLLOW METAL DOORS AND FRAMES, for hollow metal doors and frames to receive paint finishes specified in this Section.

1.4 SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.

1. Submit Samples on rigid backing, 8 inches square.
2. Step coats on Samples to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

C. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.
3. VOC content.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Sherwin-Williams Company (The): General paint and varnish coatings.

B. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed in other Part 2 articles for the paint category indicated.

2.2 PAINT, GENERAL

A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."

B. 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.

C. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

1. Flat Paints and Coatings: 50 g/L.
2. Nonflat Paints and Coatings: 150 g/L.
3. Dry-Fog Coatings: 400 g/L.
4. Primers, Sealers, and Undercoaters: 200 g/L.
5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
6. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
7. Pretreatment Wash Primers: 420 g/L.

A. Colors: Colors: Colors: Match existing colors for like substrates, as indicated in Drawings.

2.3 GYPSUM DRYWALL PAINT SYSTEM

A. Latex System: Eggshell / Satin Finish

B. 1st Coat: S-W ProMar 200 Zero VOC Interior Latex Primer, B28W2600 (4 mils wet, 1.5 mils dry).

C. 2nd Coat: S-W ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series

D. 3rd Coat: S-W ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series (4 mils wet, 1.7 mils dry per coat).

2.5 MASONRY PAINT SYSTEM

A. Latex System: Eggshell / Satin Finish

B. 1st Coat: S-W PrepRite Block Filler, B25W25 (75-125 sq ft/gal).

C. 2nd Coat: S-W ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series.

D. 3rd Coat: S-W ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series (4 mils wet, 1.7 mils dry per coat).

2.6 STEEL PAINT SYSTEM

A. Latex System: Semi-Gloss Finish

B. 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series (5.0 mils wet, 2.0 mils dry).

C. 2nd Coat: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series.

D. 3rd Coat: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series (4.0 mils wet, 1.6 mils dry per coat).

2.7 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner may engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

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 the Work.

B. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

C. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer.

E. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

F. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

3.3 APPLICATION

A. Apply paints per manufacturer's written instructions and to recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
4. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. 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.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. 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.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

END OF SECTION 09 91 23

SECTION 14 24 13 – HYDRAULIC ELEVATOR MODERNIZATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Municipality of Anchorage Standard Specifications – Buildings (MASSB), apply to this Section.

1.2 WORK INCLUDED

A. One hydraulic freight elevator.

B. All engineering, equipment, labor, and permits required to satisfactorily complete elevator modernization required by Contract Documents.

C. Applicable conditions of MASSB, General, Special, and Supplemental Conditions, Division 1, and all sections listed in Contract Documents "Table of Contents."

D. Additional equipment or finishes furnished under other sections, installed under this section:
1. Card reader security system.

E. Cartage and Hoisting: All required staging, hoisting and movement to, on, and from the site including new equipment, reused equipment, or dismantling and removal of existing equipment.

F. Unless specifically identified as "Reuse," "Retain," or "Refurbish," provide new equipment.

G. Protective barriers between cars in normal operation and adjacent cars in the modernization process. Full depth and height of hoistway.

H. Hoistway, pit, and machine room barricades as required.

1.3 RELATED WORK PROVIDED UNDER OTHER SECTIONS

A. See Section 01 90 00, Related Work Provided Under Other Sections.

1.4 DEFINITIONS

A. Terms used are defined in the latest edition of the Safety Code for Elevators and Escalators, ASME A17.1.

B. Reference to a device or a part of the equipment applies to the number of devices or parts required to complete the installation.

1.5 QUALITY ASSURANCE

A. Qualified Contractors: Alternate Contractors must receive approval of Architect, Owner, and/or Consultant at least fourteen days prior to bid date.

B. Approved Contractors:
   1. Hydraulic Elevators: Otis Elevator Company, Schindler Elevator Corporation, TK Elevator Corporation, Arctic Elevator Company.
   2. Freight Vertical Bi-Parting Door: Courion, EMS, Peelle.
   3. Alternate Contractors must receive approval of Architect, Owner and/or Consultant at least fourteen calendar days prior to bid date.

C. Compliance with Regulatory Agencies: See Section 01 35 00, Project Procedures.

D. Warranty:
   1. Material and workmanship of installation shall comply in every respect with Contract Documents. Correct defective material or workmanship which develops within one year from date of final acceptance of all work to satisfaction of Architect, Owner and Consultant at no additional cost, unless due to ordinary wear and tear, or improper use or care by Owner. Perform maintenance in accordance with terms and conditions indicated in the Preventive Maintenance Agreement.
   2. Defective is defined to include, but not be limited to operation or control system failures, car performance below required minimum, excessive wear, unusual deterioration, or aging of materials or finishes, unsafe conditions, the need for excessive maintenance, abnormal noise, or vibration, and similar unsatisfactory conditions.
   3. Retained Equipment: All retained components, parts, and materials shall be cleaned, checked, modified, repaired, or replaced, so each component and its parts are in like new operating condition. Retained equipment must be compatible for integration with new systems. All retained equipment shall be covered under the warranty provisions.
   4. Make modifications, requirements, adjustments, and improvements to meet performance requirements of Section 01700.

1.6 DOCUMENT AND SITE VERIFICATION

A. In order to discover and resolve conflicts or lack of definition which might create problems, Contractor must review Contract Documents and site conditions for compatibility with its product prior to submittal of quotation. Review existing structural, electrical provisions, and mechanical provisions for compatibility with Contractor's products. Owner will not pay for change to structural, mechanical, electrical, or other systems required to accommodate Contractor’s equipment.

1.7 SUBMITTALS

A. See Section 01 33 00, Submittals, and Section 01 70 00, Execution and Closeout Requirements Contract Compliance Review, Article 1.3.

1.8 PERMIT, TEST, AND INSPECTION

A. Obtain and pay for permit, license, and inspection fee necessary to complete installation.

B. Perform test required by governing authority in accordance with procedure described in ASME A17.2 Guide for Inspection of Elevators, Escalators, and Moving Walks in the presence of Authorized Representative.

C. Supply personnel and equipment for test and final review by Consultant, as required in Section 01 70 00.

1.9 MAINTENANCE

A. Interim: See Section 01800, Maintenance, Article 1.1 A.

B. Warranty Maintenance: See Section 01 80 00, Maintenance, Article 1.2 A.

C. Preventive Maintenance: See Section 01 80 00, Maintenance, Article 1.3 A.

PART 2 - PRODUCTS

2.0 SUMMARY

A. One freight elevator. Unless specifically identified as “retain existing,” provide new equipment.

Freight Elevator	Existing Equipment	Disposition
Capacity:	10,000 lbs.	Retain existing
Class Loading:	Freight Class C3	Retain existing
Contract Speed:	70 fpm	Retain existing
Machine:	Hydraulic pump	Provide New Dry Unit.
Machine Location:	Adjacent	Retain existing
Operational Control:	Single automatic pushbutton Selective collective Microprocessor-based system	Selective collective microprocessor-based system
Motor Control:	Single speed AC with Wye Delta start	Single speed AC with electronic soft start
Power Characteristics:	480 volts, 3 phase, 60 hertz Field verify	Retain existing
Stops and Openings:	7 stops	Retain existing
Floors Served:	4 front and 3 rear	Retain existing

Freight Elevator	Existing Equipment	Disposition
Minimum Clear Interior:	Field verify	Retain existing
Entrance Size:	Field verify	Retain existing
Entrance Type:	Power biparting	Retain existing
Door Operator:	Courion power biparting	New power door controller
Door Protection:	Safety astragal and gate reversing edge	New safety astragal and gate reversing edge.
Hydraulic Type:	Direct plunger	Retain existing.
Guide Rails:	Planed Steel Tees	Retain existing.
Buffers:	Spring	Retain existing
Alternates:		See Section 01030

2.1 MATERIALS

A. See Section 01600, Materials.

2.2 CAR PERFORMANCE

A. Car Speed: +10%/-20% of contract speed under any loading condition.

B. Car Capacity: Safely lower, stop, and hold 125% of rated load.

C. Car Stopping Zone: ±1/4" under any loading condition.

2.3 OPERATION

A. Selective Collective Microprocessor-Based:
   1. Operate car without attendant from pushbuttons in car and located at each floor. When car is available, automatically start car and dispatch it to floor corresponding to registered car or hall call. Once car starts, respond to registered calls in direction of travel and in the order the floors are reached.
   2. Do not reverse car direction until all car calls have been answered, or until all hall calls ahead of car and corresponding to the direction of car travel have been answered.
   3. Slow car and stop automatically at floors corresponding to registered calls, in the order in which they are approached in either direction of travel. As slowdown is initiated for a hall call, automatically cancel hall call. Cancel car calls in the same manner. Hold car at arrival floor an adjustable time interval to allow passenger transfer.
   4. Answer calls corresponding to direction in which car is traveling unless call in the opposite direction is highest (or lowest) call registered.

5. Illuminate appropriate pushbutton to indicate call registration. Extinguish light when call is answered.

B. Other Items:
1. Low Oil Control: In the event oil level is insufficient for travel to the top floor, provide controls to return elevator to the main level and park until oil is added.
2. Independent Service: Provide controls for operation of each car from its pushbuttons only. Close doors by constant pressure on desired destination floor button or door close button. Open doors automatically upon arrival at selected floor.

C. Firefighters' Service: Provide equipment and operation in accordance with code requirements.

D. Automatic Car Stopping Zone: Stop car within 1/4" above or below the landing sill. Maintain stopping zone regardless of load in car, direction of travel, distance between landings.

E. Remote Monitoring and Diagnostics: Equip controller with standard ports, interface boards, and drivers to accept maintenance, data logging, fault finding diagnostic, and monitoring computers, keyboards, modems, and programming tools. The system shall be capable of driving remote color CRT monitors that continually scan and display the status of car and call.

F. Motion Control: AC type with unit valve suitable for operation specified and capable of providing smooth, comfortable car acceleration and retardation. Limit the difference in car speed between full load and no load to not more than +10%/-20% of the contract speed.

G. Power Door Operation: Open door and gate automatically when car arrives at a floor. Control door and gate closing by using constant-pressure buttons on car or at each floor. Provide passenger sequence operation. Provide reversing safety edge device on car gate. Provide automatic door and gate closing feature with warning buzzer.

H. Standby Lighting and Alarm: Car mounted battery unit with solid-state charger to operate alarm bell and car emergency lighting. Battery to be rechargeable with minimum five-year life expectancy. Include required transformer. Provide constant pressure test button in service compartment of car operating panel.

I. Card/Proximity Reader Security System: Provide provisions inside car for reader unit. Mount reader unit as directed by Architect and cross connect from car pushbuttons to control module in machine room. Reader control unit, mounting brackets, wiring materials, logic circuits, etc., by Security Subcontractor. Provide a filler plate to match card slot size and car return panel finish, including direction of graining, where card slot or proximity reader cutout is not initially utilized. Elevator control systems shall facilitate system tracking of persons accessing secure floors via printout by passenger I.D. number, floor accessed, and time of entry.

2.4 MACHINE ROOM EQUIPMENT

A. Arrange equipment in existing machine room spaces and/or as shown on drawings.

B. Pump Unit: Assembled unit consisting of positive displacement pump, induction motor, master-type control valves combining safety features, holding, direction, bypass, stopping, manual lowering functions, shut off valve, oil reservoir with protected vent opening, oil level gauge, outlet strainer, drip pan, muffler, all mounted on isolating pads. Provide oil thermal unit and oil temperature thermostat to maintain oil at operating temperature. Enclose entire unit with removable sheet steel panels lined with sound-absorbing material. Provide SCR soft start with closed transition. Design unit for 120 up starts/hour.

C. Landing Systems: Solid-state, magnetic, or optical type.

D. Controller: UL/CSA labeled.
   1. Compartment: Securely mount all assemblies, power supplies, chassis switches, relays, etc., on a substantial, self-supporting steel frame. Completely enclose equipment with covers. Provide means to prevent overheating.
   2. Relay Design: Magnet operated with contacts of design and material to insure maximum conductivity, long life, and reliable operation without overheating or excessive wear. Provide wiping action and means to prevent sticking due to fusion. Contacts carrying high inductive currents shall be provided with arc deflectors or suppressors.
   3. Microprocessor-Related Hardware:
      a. Provide built-in noise suppression devices which provide a high level of noise immunity on all solid-state hardware and devices.
      b. Provide power supplies with noise suppression devices.
      c. Isolate inputs from external devices, such as pushbuttons, with opto-isolation modules.
      d. Design control circuits with one leg of power supply grounded.
      e. Safety circuits shall not be affected by accidental grounding of any part of the system.
      f. System shall automatically restart when power is restored.
      g. System memory shall be retained in the event of power failure or disturbance.
      h. Equipment shall be provided with Electro Magnetic Interference (EMI) shielding within FCC guidelines.
   4. Wiring: CSA labeled copper for factory wiring. Neatly route all wiring interconnections and securely attach wiring connections to studs or terminals.
   5. Permanently mark components, relays, fuses, PC boards, etc., with symbols shown on wiring diagrams.
   6. Provide controller or pump unit mounted auxiliary lockable “open,” disconnect if mainline disconnect is not in sight of controller and/or pump unit.

E. Muffler: Provide in discharge oil line near pump unit. Design shall dampen and absorb pulsation and noise in the flow of hydraulic fluid.

F. Piping and Oil: Retain existing piping and provide new oil for the system.

G. Shutoff Valve: Manual valve in line adjacent to pump unit. Provide second valve in pit adjacent to jack unit.

2.5 HOISTWAY EQUIPMENT

A. Guide Rails: Retain main guide rails in place.
   1. Clean rails and brackets. Remove rust.
   2. Check all rail and bracket fastenings and tighten.
   3. Realign rails as required to provide smooth car ride.
   4. Provide supplemental rail brackets and/or backing as required by code or to enhance car ride quality.

B. Buffers: Retain existing. Rebuild as required and paint.

C. Hydraulic Jack Assembly: Retain existing.
   1. Cylinder: Retain existing.
   2. Plunger: Retain existing. Isolate plunger from car frame.
      a. Replace packing gland.

D. Jack Support and Fluid Shut-Off Valve: Retain existing steel pit channels to support jack assembly and transmit loads to building structure. Provide manual on/off valve in oil line adjacent to pump unit and jack unit in pit adjacent to jack unit.

E. Overspeed Valve: Provide a pressure sensitive, mechanically actuated seismic safety valve, conforming to ASME A17.1, Rule 2410.6, 3.19.4.7. Connect valve directly to jack assembly inlet.

F. Terminal Stopping: Provide normal and final devices. Provide emergency terminal speed limiting devices.

G. Electrical Wiring and Wiring Connections:
   1. Conductors and Connections:
      a. Copper throughout with individual wires coded and connections on identified studs or terminal blocks.
      b. Use no splices or similar connections in wiring except at terminal blocks, control compartments, or junction boxes.
      c. Provide 10% spare conductors throughout. Run spare wires from car connection points to individual elevator controllers in the machine room.
      d. Provide four pair of spare shielded communication wires in addition to those required to connect specified items.
      e. Tag spares in machine room.
   2. Conduit:
      a. Painted or galvanized steel conduit, EMT, or duct.
      b. Minimum Conduit Size: 1/2".
      c. Flexible heavy-duty service cord may be used between fixed car wiring and car door switches for door protective devices.
      d. Conduit from the closest hoistway of each elevator group or single elevator to the firefighters' control room, and/or main control console. Coordinate size, number, and location of conduits with Electrical Contractor.
   3. Traveling Cables:
      a. Flame and moisture-resistant outer cover.

b. Prevent traveling cable from rubbing or chafing against hoistway or equipment within hoistway.
c. Provide five pair of shielded wires and two RG-6/U type coaxial cables for card reader.
d. Provide two RG-6/U coaxial CCTV cables within traveling cable from car controller to car top, plus 3'-0" excess loop at both ends.
e. Provide two pair 14-gauge wire for CCTV power.

4. Auxiliary Wiring: Connect fire alarm initiating devices, emergency two-way communication system, firefighters' phone jack, paging speaker, CCTV, card reader, and intercom in each car controller in machine room.

H. Entrance Equipment:
1. Door guide tracks: Retain. Clean and provide new lubricant.
2. Door guide shoes: Provide new machined iron shoes. Four shoes per panel, with not less than 2½" lateral contact per shoe.
3. Door interlocks: Provide new interlocks operable without cam.

I. Hoistway Door Unlocking Device: Provide unlocking device with pull chain under hinged, lockable cover with stainless steel No. 4 finish at all floors.

J. Floor Numbers: Stencil paint 4" high floor designations in contrasting color on inside face of hoistway doors or hoistway fascia in location visible from within car.

2.6 HOISTWAY ENTRANCES

A. Frames: Retain existing.

B. Fascia, Toe Guards, and Hanger Covers: Retain existing. Provide as required where damaged or missing. Check and tighten all fastenings.

C. Finish of Frames and Doors: Retain.

D. Vertical Bi Parting Freight Door Panels: Retain existing.

2.7 CAR EQUIPMENT

A. Frame: Retain Existing. Check and tighten all fastenings.

B. Platform: Retain existing. Reinforce if required. Check and tighten all fastenings.

C. Platform Apron: Retain existing. Check and tighten al fastenings. Replace damaged or missing sections.

D. Guide Shoes: Swivel type with renewable oilless inserts to accommodate freight loading classification.

E. Finish Floor Covering: Retain existing.

F. Sills: Retain existing. Clean and polish. Check and tighten all fastenings.

G. Door Electrical Contact: Prohibit car operation unless car door is closed.

H. Freight Door and Gate Operator:
1. Retain Power door and gate. Provide means to open doors and gate from inside of car in the event of power failure.
2. Provide new operators, interlocks, chains, etc.
3. Closing speed:
   a. Doors: Minimum of 0.8 fps.; maximum of 1.0 fps.
   b. Gates: Minimum of 1.6 fps.; maximum of 2.0 fps.

I. Car Gate: Retain existing. Check and tighten all fastenings of gate, tracks, operator, gate contact, etc.

J. Infrared Reopening Device: Black, fully enclosed device with full screen infrared matrix or multiple beams extending vertically inside or along edge of each car gate guide track to a minimum height of 7'-0" above finished floor to a height of 10'-0" above finished floor. Include retractable infrared sensor beams positioned at each side of lower edge of gate. Obstruction of beams during gate closing shall cause immediate re-opening.

K. Car Operating Panel:
1. Two vandal resistant car operating panel with faceplate consisting of a metal box containing operating fixtures, recessed mounted in the side wall adjacent to front and rear entrance.
   a. Provide metal vandal resistant red emergency push pull stop device at bottom of car operating panel. Maintain registered calls when feature is actuated and continue normal service after power is restored. Actuation of device shall sound car alarm bell and illuminate alarm button. Arrange switch to sound main control panel distress signal when actuated. Mark device to indicate “push to run” and “pull to stop” positions.
   b. Provide “door open” button to stop and reopen doors or hold doors in open position.
   c. Provide constant pressure “door close” button to close doors.
   d. Provide “door stop” button.
   e. Provide manually operated stop switch within Firefighters’ Phase II compartment Arrange switch to sound group control panel distress signal when actuated.
   f. Provide “door open” button to stop and reopen doors or hold doors in open position.
   g. Provide “door close” button to activate door close cycle. Cycle shall not begin until normal door dwell time for a car or hall call has expired, except firefighters’ operation.
   h. Locked panel including Phase II fire access switch and hidden floor buttons, call cancel button, door open, door close, switch, stop switch, light jewel, fire communication jack within locked panel, for fire officer use and use of car on independent service only

2. Include the following controls in lockable service cabinet with function and operating positions identified by permanent signage or engraved legend:
   a. Inspection switch.
   b. Light switch.
   c. Three-position exhaust blower switch.
   d. Independent service switch.
   e. Constant pressure test button for battery pack emergency lighting.
   f. 120-volt, AC, GFCI protected electrical convenience outlet.
   g. Card reader override switch.
   h. Stop switch.
   i. Switch to select either floor voice annunciation, floor passing tone, or chime.
3. Provide black paint filled (except as noted), engraved, or approved etched signage as follows with approved size and font:
   a. Phase II firefighters' operating instructions on main operating panel above corresponding keyswitch filled red.
   b. Car number on main and auxiliary car operating panel.
   c. "Certificate of Inspection on File in Building Office" on main car operating panel.
   d. "No Smoking" main car operating panel.
   e. Car capacity in pounds on main car operating panel service compartment door.
   f. Freight loading classification and description on car operating panel.

L. Car Top Control Station: Mount to provide safe access and utilization while standing in an upright position on car top.

M. Work Light and Duplex Plug Receptacle: GFCI protected outlet at top and bottom of car. Include on/off switch and lamp guard.

N. Communication System:
1. "Push to Call," two-way communication instrument in car with automatic dialing, tracking, and recall features with shielded wiring to car controller in machine room. Provide dialer with automatic rollover capability with minimum two numbers.
   a. "Push to Call" button or adjacent light jewel shall illuminate and flash when call is acknowledged. Button shall match car operating panel pushbutton design. Provide uppercase "PUSH TO CALL," "HELP ON THE WAY" engraved signage adjacent to button.
   b. Provide "Push to Call" button tactile symbol, engraved signage, and Braille adjacent to button mounted integral with car front return panel.
2. Firefighters' telephone jack in car, with four shielded wires to machine room junction box. Jack bezel shall match adjacent controls.
3. Provide two-way communication between car and machine room if required.

2.8 CAR ENCLOSURE

A. Retain existing. Modify as required for application of new signal and pushbutton fixtures. Check and tighten all fasteners.

2.9 HALL CONTROL STATIONS

A. Pushbuttons: Provide flush mounted riser adjacent to hoistway entrances. Include single call button and “in use” light which illuminates when hall call is registered. Pushbutton design shall match car operating panel pushbuttons. Provide vandal resistant pushbutton and light assemblies. Provide enlarged faceplate to cover existing wall blockout. Include approved engraved message and pictorial representation prohibiting use of elevator during fire or other emergency situation as part of faceplate. Provide any cutting and patching required.

B. Door Control Stations: Include vandal resistant “door open,” “door close,” and “stop” buttons for control of power operated vertical bi-parting doors at each landing call button fixture. Provide buttons integral with hall control station. Pushbutton design shall match car operating panel pushbuttons. Provide any cutting and patching required.

2.10 SIGNALS

A. Car Direction Lantern: Provide flush-mounted car lantern in all car entrance columns. Illuminate up or down LED lights and sound electronic tone once for up and twice for down direction travel as doors open. Sound tone once for up direction and twice for down direction. Sound level shall be adjustable from 0-80 dBA measured at 5'-0" in front of hall control station and 3'-0" off floor. Provide adjustable car door dwell time to comply with ADA requirements relative to hall call notification time. Car direction lenses shall be arrow shaped with faceplates. Lenses shall be minimum 2½" in their smallest dimension. Provide vandal resistant lantern and light assemblies consisting of series of dots or lines for maximum visibility.

B. Car Position Indicator: Alpha-numeric digital indicator containing floor designations and direction arrows a minimum of 1/2" high to indicate floor served and direction of car travel. Locate fixture in each car operating panel. When a car leaves or passes a floor, illuminate indication representing position of car in hoistway. Illuminate proper direction arrow to indicate direction of travel.

C. Faceplate Material and Finish: Satin stainless steel, all fixtures.

D. Floor Passing Tone: Provide an audible tone of no less than 20 decibels and frequency of no higher than 1500 Hz, to sound as the car passes or stops at a floor served.

E. Firefighters’ Key Box: Flush-mounted box with lockable hinged cover. Engrave instructions for use on cover per Local Fire Authority requirements.

2.11 GROUP CONTROL AND DISPLAY PANEL

A. Firefighters’ Control Panel: Locate in building fire control room. Fixture faceplate, stainless steel satin finish, including the following features:
   1. Car position and direction indicator (digital-readout or color SVGA display type). Identify each position indicator with car number identification.
   2. Indicator showing operating status of car.
   3. Manual car standby power selection switches and power status indicators.

4. Two-position firefighters' emergency return switches and indicators with engraved instructions filled red.
5. Fixtures and monitor shall be located as directed by Architect. Where applicable, identify all indicators and manual switches with appropriate engraving. Provide conduit and wiring to control panel.

B. Firefighters' Key Box: Flush-mounted box with lockable hinged cover. Engrave instructions for use on cover per Local Fire Authority requirements.

2.12 INTERCOM AND DISTRESS SIGNAL SYSTEM

A. General: Provide intercommunication system for car. Include all wiring between elevator hoistways and control panels. Include the following stations:

Station Location	Type Station	Selection Buttons to Call
Elevator Machine Room	Master	Control Panels, Car
Firefighters' Control Panel	Master	Machine Rooms, Car
Car	Remote	Lobby Control Panel

B. Basic Equipment:
1. Amplifier providing static-free voice transmission with adequate volume and minimum distortion at all stations, with pre-amplifier capable of receiving voice and music inputs from building and emergency building communication system.
2. Activation of emergency building communication system overrides all other conversations and permits one-way conversation to all master stations in system.
3. Master Stations:
   a. Speaker-microphone combination and/or handset for two-way communication.
   b. Selection buttons to enable communication with all master stations. Maintain continual reception of hands-free reply from station when a selected button is depressed.
   c. Two-Position "Talk/Listen" Button: Press to talk; release to listen.
   d. Illuminate "in use" light when any master station is being used.
   e. Reset button to make system available for use by any master station.
   f. Volume control knob for adjustment of incoming volume.
   g. Button to establish communications with all stations.
   h. Distress light in lobby panel which illuminates when "push to call" button or alarm button in car is actuated. Energize distress light and buzzer or chime until intercom selection button for that car has been depressed. Sound buzzer or chime in lobby panel simultaneously with illumination of distress light.
4. Remote Stations:
   a. Station in car shall be activated by "push to call," two-way communication button. "Push to call" button shall illuminate and flash when call is acknowledged. Button shall match car operating panel pushbutton design. Provide uppercase "PUSH TO CALL," "HELP ON THE WAY" engraved signage adjacent to button. Provide

"push to call" button tactile symbol, engraved signage, and Braille adjacent to button.

b. Locate car microphone and speaker, or transceiver/speaker combination in car canopy with drilled speaker pattern with shielded wiring to machine room junction box.

C. Station Housings:

1. House master station in machine room in a metal compartment with baked enamel finish. Attach to the group elevator supervisory control panel or wall mount. Provide communication handset with 25'-0" long cord.
2. Provide control center master intercoms with satin finish stainless steel faceplates and engraved operating instructions. Coordinate faceplate size and installation of units with building Console Supplier.

2.13 SEISMIC OPERATIONS AND EQUIPMENT

A. Provide design, components, and operation per governing code.

PART 3 - EXECUTION

3.0 SITE CONDITION INSPECTION

A. Prior to beginning installation of equipment, examine hoistway and machine room areas. Verify no irregularities exist which affect execution of work specified.

B. Do not proceed with installation until work in place conforms to project requirements.

3.1 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver material in Contractor's original, unopened protective packaging.

B. Store material in original protective packaging. Prevent soiling, physical damage, or moisture damage.

C. Protect equipment and exposed finishes from damage and stains during transportation, erection, and construction.

3.2 INSTALLATION

A. Install all equipment in accordance with Contractor's instructions, referenced codes, specification, and approved submittals.

B. Install machine room equipment with clearances in accordance with referenced codes and specification.

C. Install all equipment so it may be easily removed for maintenance and repair.

D. Install all equipment for ease of maintenance.

E. Install all equipment to afford maximum accessibility, safety, and continuity of operation.

F. Remove oil, grease, scale, and other foreign matter from the following equipment and apply one coat of field-applied machinery enamel.
   1. All exposed equipment and metal work installed as part of this work which does not have architectural finish.
   2. Neatly touch up damaged factory-painted surfaces with original paint color. Protect machine-finish surfaces against corrosion.

3.3 FIELD QUALITY CONTROL

A. Work at jobsite will be checked during course of installation. Full cooperation with reviewing personnel is mandatory. Accomplish corrective work required prior to performing further installation.

B. Have Code Authority acceptance inspection performed and complete corrective work.

3.4 ADJUSTMENTS

A. Install hydraulic jack assembly and guide rails plumb and align vertically with tolerance of 1/16" in 100'-0". Secure guide rail joints without gaps and file any irregularities to a smooth surface.

B. Static balance car to equalize pressure of guide shoes on guide rails.

C. Lubricate all equipment in accordance with Contractor’s instructions.

D. Adjust motors, valves, controllers, leveling switches, limit switches, stopping switches, door operators, interlocks, and safety devices to achieve required performance levels.

3.5 CLEANUP

A. Keep work areas orderly and free from debris during progress of project. Remove packaging materials on a daily basis.

B. Remove all loose materials and filings resulting from work.

C. Clean machine room equipment and floor.

D. Clean hoistways, car, car enclosure, entrances, operating, and signal fixtures.

3.6 ACCEPTANCE REVIEW AND TESTS

A. See Section 01 70 00, Article 1.2, Consultant’s Final Observation and Review Requirements.

3.7 OWNER'S INFORMATION

A. See Section 01 70 00, Article 1.3, Final Contract Compliance Review.

END OF SECTION 14 24 13

SECTION 22 05 00 - COMMON WORK RESULTS FOR PLUMBING

PART 1 - GENERAL

1.1 SCOPE

A. All provisions of the Contract including the General and Supplementary Conditions and the General Requirements apply to this work.

1.2 WORK INCLUDED

A. The work to be included in these and all other plumbing subsections shall consist of providing, installing, adjusting and setting into proper operation complete and workable systems for all items shown on the drawings, described in the specifications or reasonably implied. This shall include the planning and supervision to coordinate the work with other crafts and to maintain a proper time schedule for delivery of materials and installation of the work.

B. Division 01 of the specifications is to be specifically included as well as all related drawings.

1.3 RELATED WORK

A. Related Work Specified Elsewhere:

1. Heating, Ventilating and Air Conditioning (HVAC) Specifications: Division 23.
2. Electrical Specifications: Division 26.
3. Motors and Connections: Division 26.
4. Starters and Disconnects: Division 26.

B. Unless otherwise indicated on the electrical drawings or the electrical schedules, provide all plumbing equipment motors, motor starters, thermal overload switches, control relays, time clocks, thermostats, motor operated valves, float controls, damper motors, electric switches, electrical components, wiring and any other miscellaneous Division 22 controls. Disconnect switches are included in the electrical work, unless specifically called out on mechanical plans.

C. Carefully coordinate all work with the electrical work shown and specified elsewhere.

1.4 REFERENCED CODES - LATEST ADOPTED EDITION

A. NFPA 13 Installation of Sprinkler Systems.

B. NFPA 70 National Electrical Code (NEC).

C. IMC International Mechanical Code.

D. UPC Uniform Plumbing Code.

E. IECC International Energy Conservation Code.

F. IFC International Fire Code.

G. IFGC International Fuel Gas Code.

H. IBC International Building Code.

1.5 PROJECT RECORD DRAWINGS

A. In addition to other requirements of Division 01, mark up a clean set of drawings as the work progresses to show the dimensioned location and routing of all mechanical work which will become permanently concealed. Show routing of work in concealed blind spaces within the building. Show exact dimensions of buried piping off of columns or exterior walls.

B. Maintain record documents at job site in a clean, dry and legible condition. Keep record documents available for inspection by the Project Manager.

C. Show the location of all valves and their appropriate tag identification.

D. At completion of project, deliver these drawings to the Owner and obtain a written receipt.

1.6 SUBMITTALS

A. See General Conditions and the General Requirements in Division 01 regarding submittals.

B. Submit by specification section complete and all at one time; partial submittals will not be considered. Submittals shall be provided in electronic PDF Format. The data in the electronic file shall be arranged and indexed under basic categories in order of the Specification Sections. An index shall be included with bookmarks and identifying tabs between sections and references to sections of specifications.

C. Catalog sheets shall be complete and the item or model to be used shall be clearly marked, and identified as to which item in the specifications or on the drawings is being submitted and with drawing fixture number where applicable.

D. Only submit on items specifically required by each specification section. If a submittal has not been requested, it will not be reviewed.

E. Submit product data for:

1. Hangers and Supports for Plumbing Piping and Equipment.
2. Identification for Plumbing Piping and Equipment.

1.7 OPERATING AND MAINTENANCE MANUALS

A. See General Conditions and the General Requirements in Division 01 regarding Operating and Maintenance Manuals.

B. Submit maintenance manuals to the Engineer covering all equipment, fixtures, devices, etc. installed by the Contractor.

C. The operation and maintenance manuals shall be submitted by specification section complete and all at one time; partial operations and maintenance manual submittals will not be considered. The Operation and maintenance manuals shall be provided in electronic PDF Format. The data in the electronic file shall be arranged and indexed under basic categories. An index shall be included with bookmarks and identifying tabs between sections and references to sections of specifications. The manual shall contain, but not limited to, the following types of information:

1. Cover sheet with name, address, telephone number of Contractor, General Contractor and major equipment suppliers.
2. Catalog cuts of all equipment, fixtures, etc. installed (Marked to identify the specific items used).
3. Manufacturer's maintenance and overhaul instruction booklets including exploded views.
4. Identification numbers of all parts and nearest sources for obtaining parts and services.
5. A copy of valve schedule and reduced scale drawings showing valve locations.
6. Written summary of instructions to Owner.
7. All manufacturers' warranties and guarantees.
8. Contractors Warranty Letter.

D. A periodic maintenance form that includes all of the equipment shall be provided with the maintenance manual. The form shall list each piece of equipment and how often maintenance is required (daily, weekly, monthly, annually). Opposite each task shall be squares for check-off for a full year (initials) to verify that the tasks are being done.

1.8 HANDLING

A. See General Conditions and the General Requirements in Division 01 regarding material handling.

B. Deliver packaged materials to job site in unbroken packages with manufacturer's label, and store to facilitate inspection and installation sequence. All items must be labeled and identified as to make, size and quality.

1.9 SUBSTITUTIONS

A. See General Conditions and the General Requirements in Division 01 for substitution request procedures.

B. In accordance with the General Conditions and the General Requirements in Division 01, Substitution and Product Options, all substitute items must fit in the available space, and be of equal or better quality including efficiency performance, size, and weight, and must be compatible with existing equipment. The Owner shall be the final authority regarding acceptability of substitutes.

1.10 DIMENSIONS

A. Before ordering any material or doing any work, the Contractor shall verify all dimensions, including elevations, and shall be responsible for the correctness of the same. No extra charge or compensation will be allowed on account of differences between actual dimensions and measurements indicated on the drawings.

B. Any differences, which may be found, shall be submitted to the Owner for consideration before proceeding with the work.

1.11 MANUFACTURER'S DIRECTIONS

A. All manufactured articles shall be applied, installed and handled as recommended by the manufacturer, unless specifically called out otherwise. Advise the Architect/Engineer of any such conflicts before installation.

1.12 PERMITS, FEES, ETC.

A. The Contractor under each Division of these specifications shall arrange for a permit from the local authority. The Contractor shall pay for any inspection fees or other fees and charges required by ordinance, law, codes and these specifications.

1.13 TESTING

A. The Contractor under each section shall perform the various tests as specified and required by the Architect, Engineer and as required by applicable code, the State and local authorities. The Contractor shall furnish all labor, fuel and materials necessary for making tests.

1.14 TERMINOLOGY

A. Whenever the words "furnish", "provide", "furnish and install", "provide and install", and/or similar phrases occur, it is the intent that the materials and equipment described be furnished, installed and connected under this Division of the Specifications, complete for operation unless specifically noted to the contrary.

B. Where a material is described in detail, listed by catalogue number or otherwise called for, it shall be the Contractor's responsibility to furnish and install the material.

C. The use of the word "shall" conveys a mandatory condition to the contract.

D. "This section" refers to the section in which the statement occurs.

E. "The project" includes all work in progress during the construction period.

F. In describing the various items of equipment, in general, each item will be described singularly, even though there may be a multiplicity of identical or similar items.

1.15 SCHEDULE OF WORK

A. The work under the various sections must be expedited and close coordination will be required in executing the work. The various trades shall perform their portion of the work at such times as directed so as to meeting scheduled completion dates, and to avoid delaying any other trade. The Architect will set up completion dates. Each contractor shall cooperate in establishing these times and locations and shall process work so as to ensure the proper execution of it.

1.16 COOPERATION AND CLEANING UP

A. The Contractor for the work under each section of the specifications shall coordinate the Contractors work with the work described in all other sections of the specifications to the end that, as a whole, the job shall be a finished one of its kind, and shall carry on the work in such a manner that none of the work under any section of these specifications shall be handicapped, hindered or delayed at any time.

B. At all times during the progress of the work, the Contractor shall keep the premises clean and free of unnecessary materials and debris. The Contractor shall, on direction at any time from the Architect, clear any designated areas or area of materials and debris. On completion of any portion of the work, the Contractor shall remove from the premises all tools and machinery and all debris occasioned by the work, leaving the premises free of all obstructions and hindrances.

1.17 WARRANTY

A. Unless a longer warranty is hereinafter called for, all work, materials and equipment items shall be warrantied for a period of one year after acceptance by the Owner. All defects in labor and materials occurring during this period, as determined by the Architect/Engineer, shall be repaired and/or replaced to the complete satisfaction of the Architect/Engineer. Guarantee shall be in accordance with Division 01.

1.18 COMPLETION REQUIREMENTS

A. In accordance with the General Conditions and the General Requirements in Division 01, Project Closeout; before acceptance and final payment, the Contractor shall furnish:

1. Accurate project record drawings, shown in red ink on prints, showing all changes from the original plans made during installation of the work.
2. Contractors One Year Warranty.
3. All Manufacturers' Guarantees.
4. Test and Balance Reports.
5. Operation and Maintenance Manuals.

1.19 INSPECTION OF SITE - REMODEL PROJECTS

A. The accompanying plans do not indicate completely the existing plumbing and mechanical installations. The bidders for the work under these sections of the specifications shall inspect the existing installations and thoroughly acquaint themselves with conditions to be met and the work to be accomplished in removing and modifying the existing work, and in installing the new work in the present building and underground serving to and from that structure. Failure to comply with this shall not constitute grounds for any additional payments in connection with removing or modifying any part of the existing installations and/or installing any new work.

1.20 RELOCATION OF EXISTING INSTALLATIONS

A. There are portions of the existing plumbing, mechanical and electrical systems, which shall remain in use to serve the finished building in conjunction with the indicated new installations. By actual examination at the site, each bidder shall determine those portions of the remaining present installations, which must be relocated to avoid interference with the installations of new work of the Contractors particular trade and that of all other trades. All such existing installations, which interfere with new installations, shall be relocated by the Contractor.

1.21 SALVAGE MATERIALS

A. The Contractor shall remove existing fixtures, equipment and other items associated with the plumbing systems where no longer required for the project. Where such items are exposed to

view or uncovered by any cutting or removal of general construction and has no continuing function (as determined by the Architect/Engineer), they shall be removed.

B. All items or materials removed from the project shall be made available for the Owner's inspection. The Owner retains the option to claim any item or material. Contractor shall deliver any claimed item or material in good condition to the place designated by the Owner. All items not claimed become the property of the contractor and shall be removed from the site.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All equipment shall be regularly cataloged items of the manufacturer and shall be supplied as a complete unit in accordance with the manufacturer's standard specifications along with any optional items required for proper installation unless otherwise noted. Maintain manufacturer's identification, model number, etc. on all equipment at all times.

B. Where more than one of an item is to be provided, all of the items shall be identical manufacture, make, model, color, etc.

2.2 RESTRICTED MATERIALS

A. No materials containing asbestos in any form shall be allowed.

B. No solder or flux containing lead shall be used on this project.

C. Any pipe or plumbing fitting or fixture, any solder, or any flux utilized on this project shall be "lead free" in accordance with the Safe Drinking Water Act, Section 1417. "Lead free" materials utilized in domestic water system shall not contain more than 0.2 percent lead when used with respect to solder and flux; and not more than a weighted average of 0.25 percent lead when used with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures. All materials utilized in domestic water system shall be certified by an ANSI accredited organization to conform to ANSI/NSF Standard 61.

D. Where materials or equipment provided by this Contractor are found to contain restricted materials, such items shall be removed and replaced with non-restricted materials items. Entire cost of restricted materials removal and disposal and cost of installing new items shall be the responsibility of the Contractor for those restricted materials containing items installed by the Contractor.

2.3 ELECTRICAL MOTORS

A. Motors: Furnish electric motors designed for the specific application and duty applied, and to deliver rated horsepower without exceeding temperature ratings when operated on power systems with a combined variation in voltage and frequency not more than + 10% of rated voltage. Motors for pumps and fans shall be selected to be non-overloading.

B. Verify from the drawings and specifications the available electrical supply characteristics and furnish equipment that will perform satisfactorily under the conditions shown and specified.

C. Size motors for 1.15 service factor and not to exceed 40º C temperature rise above ambient.

D. Fractional horsepower motors to have self-resetting thermal overload switch.

2.4 IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

A. Plastic Nameplates: Laminated plastic with engraved letters.

B. Plastic Tags: Laminated plastic with engraved letters, minimum 1-1/2 inches diameter.

C. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering.

D. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.

2.5 PIPE HANGERS AND SUPPORTS

A. Acceptable Manufacturers:

1. Anvil.
2. B-Line Systems, Inc.
3. Erico.
4. PHD Manufacturing, Inc.
5. Tolco.

B. Plumbing Piping - DWV:

1. Conform to ANSI/MSS SP58.
2. Hangers for Pipe Sizes ½ to 1-½ Inch: Malleable iron or carbon steel, adjustable swivel, split ring.
3. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
5. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
6. Vertical Support: Steel riser clamp.

7. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
8. Copper Pipe Support: Carbon steel ring, adjustable, copper plated with neoprene isolation pad.

2.6 HANGER RODS

A. Steel Hanger Rods: Mild steel, threaded both ends, threaded one end, or continuous threaded. Minimum Hanger Rod Sizes:

PIPE AND TUBE SIZE (INCHES)	ROD SIZE (INCHES)
1/4 to 4	3/8

PART 3 - EXECUTION

3.1 DRAWINGS

A. The drawings are partly diagrammatic, not necessarily showing all offsets or exact locations of piping and ducts, unless specifically dimensioned. The contractor shall provide all materials and labor necessary for a complete and operable system. Complete details of the building which affect the mechanical installation may not be shown. For additional details, see Architectural and Electrical Drawings. Coordinate work under this section with that of all related trades.

3.2 INSTALLATION

A. All work shall comply with the latest adopted applicable codes and ordinances including, but not limited to, the IMC, UPC, IBC, NEC, NFPA, IECC, IFGC and IFC Standards; all local and state amendments to all codes and standards.

B. Obtain and pay for all inspection fees, connection charges and permits as a part of the Contract.

C. Compliance with codes and ordinances shall be at the Contractor's expense.

3.3 MEASUREMENTS

A. Verify all measurements on the job site.

B. Locate all equipment and fixtures on the centers of walls, openings, spaces, etc., unless specified otherwise.

C. Check all piping, equipment, etc. to clear openings.

D. Rough-in dimensions shall be per manufacturer's recommendations and in compliance with current ADA and ANSI 117.1 standards.

3.4 OPERATING INSTRUCTIONS

A. Before the facility is turned over to the Owner, instruct the Owner or Owner's personnel in the operation, care and maintenance of all systems and equipment under the jurisdiction of the Plumbing Division. These instructions shall also be included in a written summary in the Operating Maintenance Manuals.

B. The Operation and Maintenance Manuals shall be utilized for the basis of the instruction. Provide a minimum of four hours of onsite instruction to the owner designated personnel.

C. When required by individual specification sections provide additional training on plumbing systems and equipment as indicated in the respective specification section.

D. Provide schedule for training activities for review prior to start of training.

3.5 SYSTEM ADJUSTING

A. Each part of each system shall be adjusted and readjusted as necessary to ensure proper functioning of all plumbing systems. Test all plumbing equipment, fixtures and piping for proper water distribution, drainage, pressure and flow, adjust systems as required to eliminate splashing, noise and vibration.

3.6 CUTTING, FITTING, REPAIRING, PATCHING AND FINISHING

A. Arrange and pay for all cutting, fitting, repairing, patching and finishing of work by other trades where it is necessary to disturb such work to permit installation of mechanical work. Perform work only with craftsmen skilled in their respective trades.

B. Avoid cutting, insofar as possible, by setting sleeves, frames, etc. and by requesting openings in advance. Assist other trades in securing correct location and placement of rough-frames, sleeves, openings, etc. for piping.

C. Cut all holes neatly and as small as possible to admit work. Include cutting where sleeves or openings have been omitted. Perform cutting in a manner so as not to weaken walls, partitions or floors. Drill holes required to be cut in floors without breaking out around holes.

3.7 PAINTING

A. Perform all of the following painting in accordance with provisions of Division 09 with colors as selected by the Architect. Provide the following items as a part of plumbing work:

1. Factory applied prime and finish coats on plumbing equipment.

B. If factory finish on any equipment furnished is damaged in shipment or during construction, refinish to equal original factory finish.

3.8 IDENTIFICATION

A. Tag all valves with heat resistant laminated plastic labels or brass tags engraved with readily legible letters. Securely fasten to the valve stem or bonnet with beaded chain. Provide a framed, typewritten directory under glass, and installed where directed. Provide complete record drawings that show all valves with their appropriate label. Seton 250-BL-G, or 2961.20-G, 2" round or equal.

B. Label all equipment with heat resistant laminated plastic labels having engraved lettering ½" high. If items are not specifically listed on the schedules, consult the Engineer concerning designation to use. Seton engraved Seton-Ply nameplates or equal.

C. Identify piping to indicate contents and flow direction of each pipe exposed to view by a labeled sleeve in letters readable from floor at least once in each room and at intervals of not more that 20' apart and on each side of partition penetrations. Coloring scheme in accordance with ANSI A13.1-1981, Seton Opti-Code or equal.

3.9 PIPE HANGERS AND SUPPORTS

A. Support plumbing piping in accordance with the latest adopted edition of the UPC.

B. Support horizontal piping as follows:

MATERIALS	TYPES OF JOINTS	HORIZONTAL	VERTICAL
Copper Tube and Pipe	Soldered or Brazed	1 ½ inches and smaller, 6 feet; 2 inches and larger, 10 feet	Each floor, not to exceed 10 feet[5]

Notes:

[1] Support adjacent to joint, not to exceed 18 inches.

[2] Brace not to exceed 40 foot intervals to prevent horizontal movement.

[3] Support at each horizontal branch connection.

[4] Hangers shall not be placed on the coupling.

[5] Vertical water lines shall be permitted to be supported in accordance with recognized engineering principles with regard to expansion and contraction, where first approved by the Authority Having Jurisdiction.

[6] See the appropriate IAPMO Installation Standard for expansion and other special requirements.

[7] See manufacturer installation instructions for additional requirements.

C. Install hangers to provide minimum ½ inch space between finished covering and adjacent work.

D. Place a hanger within 12 inches of each horizontal elbow.

E. Use hangers with 1-½ inch minimum vertical adjustment.

F. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.

G. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.

H. Where several pipes can be installed in parallel and at the same elevation, provide multiple or trapeze hangers.

I. Support riser piping independently of connected horizontal piping.

J. Provide transverse seismic support for all piping systems.

3.10 INSTALLATION OF EQUIPMENT

A. Unless otherwise indicated, mount all equipment and install in accordance with manufacturer's recommendations and approved submittals.

B. Maintain manufacture recommended minimum clearances for access and maintenance.

C. Furnish all structural steel, such as angles, channels, beams, etc. required to support all piping, equipment and accessories installed under this Division. Use structural supports suitable for equipment specified or as indicated. In all cases, support design will be based upon data contained in manufacturer's catalog.

D. Openings: Arrange for necessary openings in buildings to allow for admittance and reasonable maintenance or replacement of all equipment furnished under this Contract.

END OF SECTION 22 05 00

SECTION 22 05 05 - SELECTIVE DEMOLITION FOR PLUMBING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work specified in this Section includes the demolition, removal, and disposition of certain mechanical work.

B. Drawings, the provisions of the Agreement, and Administrative Specification Sections apply to all work of this Section.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of conditions as satisfactory.

3.2 DEMOLITION, REMOVAL AND DISPOSITION

A. Piping, Equipment, and Control Wiring to Be Removed: Remove all piping, equipment, and control wiring as indicated. Drawings do not show all existing piping, equipment, and control wiring which is to be removed. Unless indicated otherwise, where existing equipment has been removed, or its use replaced by new equipment, remove connecting piping back to the branch in the main so that there will be no dead ends or unused pipe lines in mechanical spaces at completion.

B. Materials to Owner: All items or materials removed from the project shall be made available for the Owner's inspection. The Owner retains the option to claim any item or material. The Contractor shall deliver any claimed item or material in good condition to the place designated by the Owner. All items not claimed become the property of the Contractor and shall be removed from the site by the Contractor.

C. Materials to Owner: As indicated on the Drawings.

D. Re-use of Materials: Only where indicated on Drawings.

E. Materials to Contractor: Materials shown or specified to be removed, other than the materials indicated to be turned over to Owner.

F. Protect any active piping and/or wiring encountered; remove, plug or cap utilities to be abandoned. Notify the Architect of utilities encountered whose service is not known.

G. Debris Removal: Existing materials removed and not reinstalled or turned over to the Owner shall be immediately removed from the site and disposed of by the Contractor.

H. Repairs: Any portion of the facility damaged, cut back or made inoperable by this Contractor shall be repaired with similar materials as the existing structure and/or damaged item as instructed by the Architect.

END OF SECTION 22 05 05

SECTION 22 10 00 - PLUMBING PIPING

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Sanitary Sewer Piping.

B. Valves.

1.2 RELATED WORK

A. Division 02 - Excavating, Backfilling, Trenching.

B. Section 22 05 00 - Common Work Results for Plumbing.

C. Section 22 30 00 - Plumbing Equipment.

1.3 QUALITY ASSURANCE

A. Valves: Manufacturer's name and pressure rating marked on valve body.

1.4 SUBMITTALS

A. Submit product data under provisions of Division 01.

B. Include data on pipe materials, pipe fittings, valves and accessories.

1.5 WARRANTY

A. Polypropylene pipe and fittings shall be covered by a factory warranty for 30 years to be free of defects in materials or manufacturing.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Division 01.

B. Store and protect products under provisions of Division 01.

C. Deliver and store valves in shipping containers with labeling in place.

PART 2 - PRODUCTS

2.1 FORCED WASTE PIPING

A. Copper Tubing: ASTM B88, Type L, hard drawn. Fittings: ASME B16.18, cast copper alloy, or ASME B16.22, wrought copper. Joints: ANSI/ASTM B32, solder, Grade 95TA; Flux: ASTM B813.

B. Polyvinyl Chloride (PVC): Schedule 80, ASTM D1785, Type 1, Grade 1, Cell classification 12454B. Fittings: Schedule 80 ASTM D2467 socket. Joints: Solvent socket weld, flanged joints shall be provided at unions, valves and equipment connections. Flanges: One piece molded hub type PVC Flat face flange conforming to ANSI B16.1.

2.2 CONDENSATE PIPING

A. Copper Pipe: ASTM B306, DWV. Fittings: ASME B16.3, cast bronze, or ASME B16.29, wrought copper. Joints: ASTM B32, solder, Grade 95TA; Flux: ASTM B813.

B. PVC Pipe: ASTM D2729. Fittings: PVC. Joints: ASTM D2855, solvent weld with ASTM D2564 solvent cement.

2.3 FLANGES, UNIONS, AND COUPLINGS

A. Pipe Size 2 Inches and Under: 150 psig malleable iron unions for threaded ferrous piping; bronze unions for copper pipe, soldered joints.

B. Pipe Size Over 2 Inches: 150 psig forged steel slip-on flanges for ferrous piping; bronze flanges for copper piping: 1/16 inch thick preformed neoprene bonded to fiber.

C. Grooved and Shouldered Pipe End Couplings: Not permitted.

2.4 ACCEPTABLE MANUFACTURERS - ALL VALVE TYPES

A. Apollo.

B. FNW.

C. Hammond.

D. Milwaukee.

E. NIBCO.

F. Red-White Valve Corp.

G. Substitutions: Under provisions of Division 01.

2.5 GATE VALVES

A. Not permitted. Use ball valves for isolation service.

2.6 GLOBE VALVES

A. Not permitted. Use ball valves for isolation service.

2.7 BALL VALVES

A. Up to 2 Inches: 600 PSI CWP Lead free bronze two piece body, full port, forged lead free brass ball, Teflon seats and adjustable packing, lever handle, solder ends.

B. Over 2 Inches: Cast steel, two piece body, full port chrome plated steel ball, Teflon seat and stuffing box seals, lever handle, flanged, solder, threaded or press-fit ends.

2.8 BUTTERFLY VALVES

A. Not permitted. Use ball valves for isolation service.

2.9 SWING CHECK VALVES

A. Over 2 Inches: 285 PSI CWP ductile iron body, stainless steel trim, swing disc, renewable disc and seat, flanged ends.

PART 3 - EXECUTION

3.1 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Remove scale and dirt, on inside and outside, before assembly.

C. Prepare piping connections to equipment with flanges or unions.

3.2 INSTALLATION

A. Provide non-conducting dielectric connections wherever jointing dissimilar metals.

B. Route piping in orderly manner and maintain gradient.

C. Install piping to conserve building space and not interfere with use of space.

D. Group piping whenever practical at common elevations.

E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

F. Provide clearance for installation of insulation and access to valves and fittings.

G. Provide access where valves and fittings are not exposed. Coordinate size and location of access doors.

H. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.

I. Prepare pipe, fittings, supports, and accessories not prefinished, ready for finish painting. Refer to Division 09.

J. Install valves with stems upright or horizontal, not inverted.

K. Support all piping in accordance with Uniform Plumbing Code and Manufacturer installation instructions. Where there is a conflict between requirements of the Uniform Plumbing Code and Manufacturer installation instructions, the more restrictive requirement shall apply.

3.3 APPLICATION

A. Install unions downstream of valves and at equipment connections.

B. Install ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.

3.4 TESTING

A. Test all sanitary sewer and vent piping in accordance with Section 712 of the UPC. Submit a signed statement to the Engineer stating testing dates, procedure and initials of tester.

END OF SECTION 22 10 00

SECTION 22 30 00 - PLUMBING EQUIPMENT

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Elevator Sump Pumps.

B. Sump Pumps.

1.2 RELATED WORK

A. Division 02 - Excavating, Backfilling, Trenching.

B. Section 22 05 00 - Common Work Results for Plumbing.

1.3 QUALITY ASSURANCE

A. Provide pumps with manufacturer's name, model number, and rating/capacity identified.

B. Ensure products and installation of specified products are in conformance with recommendations and requirements of the following organizations:

1. National Electrical Manufacturers' Association (NEMA).
2. Underwriters Laboratories (UL).

1.4 SUBMITTALS

A. Submit product data under provisions of Division 01.

B. Indicate pump type, capacity, materials of construction, power requirements, and affected adjacent construction.

C. Submit manufacturer's installation instructions under provisions of Division 01.

1.5 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data under provisions of Division 01.

B. Include operation, maintenance, and inspection data, replacement part numbers and availability, and service depot location and telephone number.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Division 01.

B. Store and protect products under provisions of Division 01.

C. Provide temporary inlet and outlet caps. Maintain caps in Place until installation.

1.7 WARRANTY

A. Provide manufacturer's warranty under provisions of Division 01.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS – ELEVATOR AND SUMP PUMPS

A. Liberty.

B. Zoeller.

C. Xylem.

D. Substitutions: Under provisions of Division 01.

2.2 ELEVATOR SUMP PUMPS

A. Operating Conditions: The manual pump is connected to a control which has the ability to prevent oil from being pumped from the elevator sump. This same control unit will activate an alarm when an oil "film" is detected or when a high water condition exits. The system will continue to monitor and remove water from the vault even if an oil condition is detected.

B. Construction: The centrifugal sump pump shall be constructed of class 25 cast iron. The motor housing shall be oil filled to dissipate heat. All mating parts shall be machined and sealed with a Buna-N o-ring. All fasteners exposed to the liquid shall be stainless steel. The motor shall be protected on the top side with sealed cord entry plate with molded pins to conduct electricity eliminating the ability of water to enter internally through the cord. The motor shall be protected on the lower side with a unitized ceramic/carbon seal with stainless steel housings and spring or engineered double lip seal with stainless steel springs. The pump shall be furnished with stainless steel handle.

C. Electrical Power Cord: The submersible pump shall be supplied with 6 feet of multiconductor power cord. It shall be cord type YELLOW UL 16-3 SJEOOW 300V 105°C, capable of continued exposure to the pumped liquid. The power cord shall be sized for the rated full load amps of the pump in accordance with the National Electric Code. The power cable shall not enter the motor housing directly but will conduct electricity to the motor by means of a water tight compression fitting cord plate assembly, with molded pins to conduct electricity. This will eliminate the ability of water to enter internally through the cord, by means of a damaged or wicking cord.

D. Motors: Single phase motors shall be oil filled, permanent split capacitor, Class B insulated NEMA B design, rated for continuous duty. At maximum load the winding temperature shall not exceed 130 degrees C unsubmerged. The pump motor shall have an integral thermal overload switch in the windings for protecting the motor. The capacitor circuit shall be mounted internally in the pump.

E. Bearings and Shaft: An upper sleeve and lower ball bearing shall be required. The lower ball bearing shall be a single ball / race type bearing. Both bearings shall be permanently lubricated by the oil, which fills the motor housing. The motor shaft shall be made of 300 or 400 series stainless steel.

F. Seals: The pump shall have a unitized carbon / ceramic seal with stainless steel housings and spring, or engineered double lip seal with stainless steel springs. The motor plate / housing interface shall be sealed with a Buna-N o-ring.

G. Impeller: The impeller shall be vortex style made of an engineered polymer, with pump out vanes on the back shroud to keep debris away from the seal area. It shall be threaded to the motor shaft.

H. Controls: The control unit has three probes and a float ball switch. The pump will activate when the middle probe contacts water, and will remain on until the first, longest probe no longer is in contact with water. A high water alarm is activated when third or shortest probe contacts water. The system will ignore a small film of oil, however larger volumes of oil will be detected when the alarm probe does not detect water and the float ball activates. The system will continue to operates, removing water not oil from the sump even when oil has been detected.

I. Paint: The exterior of the casting shall be protected with powder coat paint.

J. Testing: The pump shall have a ground continuity check and the motor chamber shall be Hi-potted to test for electrical integrity, moisture content and insulation defects. The motor and volute housing shall be pressurized, and an air leak decay test is performed to ensure integrity of the motor housing. The pump shall be run, voltage current monitored, and the tester checks for noise or other malfunction.

2.3 SUMP PUMP

A. Operating Conditions: The pump will operate through integral float to remove water from the sump.

B. Construction: The centrifugal sump pump shall be constructed of class 25 cast iron. The motor housing shall be oil filled to dissipate heat. All mating parts shall be machined and sealed with a Buna-N o-ring. All fasteners exposed to the liquid shall be stainless steel. The motor shall be protected on the top side with sealed cord entry plate with molded pins to conduct electricity eliminating the ability of water to enter internally through the cord. The motor shall be protected on the lower side with a unitized ceramic/carbon seal with stainless steel housings and spring or engineered double lip seal with stainless steel springs. The pump shall be furnished with stainless steel handle.

C. Electrical Power Cord: The submersible pump shall be supplied with 25 feet of multiconductor power cord. It shall be cord type YELLOW UL 16-3 SJEOOW 300V 105°C, capable of continued exposure to the pumped liquid. The power cord shall be sized for the rated full load amps of the pump in accordance with the National Electric Code. The power cable shall not enter the motor housing directly but will conduct electricity to the motor by means of a water tight compression fitting cord plate assembly, with molded pins to conduct electricity. This will eliminate the ability of water to enter internally through the cord, by means of a damaged or wicking cord.

D. Motors: Single phase motors shall be oil filled, permanent split capacitor, Class B insulated NEMA B design, rated for continuous duty. At maximum load the winding temperature shall not exceed 130 degrees C unsubmerged. The pump motor shall have an integral thermal overload switch in the windings for protecting the motor. The capacitor circuit shall be mounted internally in the pump.

E. Bearings and Shaft: An upper sleeve and lower ball bearing shall be required. The lower ball bearing shall be a single ball / race type bearing. Both bearings shall be permanently lubricated by the oil, which fills the motor housing. The motor shaft shall be made of 300 or 400 series stainless steel.

F. Seals: The pump shall have a unitized carbon / ceramic seal with stainless steel housings and spring, or engineered double lip seal with stainless steel springs. The motor plate / housing interface shall be sealed with a Buna-N o-ring.

G. Impeller: The impeller shall be vortex style made of an engineered polymer, with pump out vanes on the back shroud to keep debris away from the seal area. It shall be threaded to the motor shaft.

H. Controls: Pump shall be configured with an integral float to automatically cycle pump to remove liquid.

I. Paint: The exterior of the casting shall be protected with powder coat paint.

J. Testing: The pump shall have a ground continuity check and the motor chamber shall be Hi-potted to test for electrical integrity, moisture content and insulation defects. The motor and volute housing shall be pressurized, and an air leak decay test is performed to ensure integrity of the motor housing. The pump shall be run, voltage current monitored, and the tester checks for noise or other malfunction.

PART 3 - EXECUTION

3.1 LIFT STATION INSTALLATION

A. Control Panel: The pump is supplied with a grounding conductor. To reduce the risk of electric shock, be certain that it is connected only to a properly grounded earth wire. All electrical circuitry should be installed in accordance with the National Electric Code (NEC) and all applicable local codes or ordinances. The control panel that is an integral part of this complete unit is supplied with its own separate Installation/Operation/Maintenance manual. Ensure that you have received this manual, and that you read and understand it prior to installing this unit. Your familiarity with the control panel manual is critical.

B. Float Switches: The float switches are pre-mounted on a quick tree. For quick tree removal, loosen the cord nut and pull the tree straight out of the tank. The pump cycle is pre-set at the factory. Do not make adjustments of more than 3" in either direction without factory and engineering approval.

C. Alarm: Coordinate final alarm location with owner. Locate receptacle in area indicated and install alarm. Extend signal cable from control panel in elevator sump to the remote alarm installation location.

D. Testing and Startup: Follow the testing and startup procedures found in the pump IOM and/or control panel manual.

END OF SECTION 22 30 00

SECTION 23 05 00 - COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

1.1 SCOPE

A. All provisions of the Contract including the General and Supplementary Conditions and the General Requirements apply to this work.

1.2 WORK INCLUDED

A. The work to be included in these and all other mechanical subsections shall consist of providing, installing, adjusting and setting into proper operation complete and workable systems for all items shown on the drawings, described in the specifications or reasonably implied. This shall include the planning and supervision to coordinate the work with other crafts and to maintain a proper time schedule for delivery of materials and installation of the work.

B. Division 01 of the specifications is to be specifically included as well as all related drawings.

1.3 RELATED WORK

A. Related Work Specified Elsewhere:

1. Plumbing Specifications: Division 22.
2. Electrical Specifications: Division 26.
3. Motors and Connections: Division 26.
4. Starters and Disconnects: Division 26.

B. Unless otherwise indicated on the electrical drawings or the electrical schedules, provide all mechanical equipment motors, motor starters, thermal overload switches, control relays, time clocks, thermostats, motor operated valves, float controls, damper motors, electric switches, electrical components, wiring and any other miscellaneous Division 23 controls. Disconnect switches are included in the electrical work, unless specifically called out on mechanical plans.

C. Carefully coordinate all work with the electrical work shown and specified elsewhere.

1.4 REFERENCED CODES - LATEST ADOPTED EDITION

A. NFPA 13 Installation of Sprinkler Systems.

B. NFPA 70 National Electrical Code (NEC).

C. IMC International Mechanical Code.

D. UPC Uniform Plumbing Code.

E. IECC International Energy Conservation Code.

F. IFC International Fire Code.

G. IFGC International Fuel Gas Code.

H. IBC International Building Code.

1.5 PROJECT RECORD DRAWINGS

A. In addition to other requirements of Division 01, mark up a clean set of drawings as the work progresses to show the dimensioned location and routing of all mechanical work which will become permanently concealed. Show routing of work in concealed blind spaces within the building. Show exact dimensions of buried piping off of columns or exterior walls.

B. Maintain record documents at job site in a clean, dry and legible condition. Keep record documents available for inspection by the Project Manager.

C. Show the location of all valves and their appropriate tag identification.

D. At completion of project, deliver these drawings to the Owner and obtain a written receipt.

1.6 SUBMITTALS

A. See General Conditions and the General Requirements in Division 01 regarding submittals.

B. Submit by specification section complete and all at one time; partial submittals will not be considered. Submittals shall be provided in electronic PDF Format. The data in the electronic file shall be arranged and indexed under basic categories in order of the Specification Sections. An index shall be included with bookmarks and identifying tabs between sections and references to sections of specifications.

C. Catalog sheets shall be complete and the item or model to be used shall be clearly marked, and identified as to which item in the specifications or on the drawings is being submitted and with drawing fixture number where applicable.

D. Only submit on items specifically required by each specification section. If a submittal has not been requested, it will not be reviewed.

E. Submit product data for:

1. Hangers and Supports for HVAC Piping and Equipment.
2. Identification for HVAC Piping, Ductwork and Equipment.

1.7 OPERATING AND MAINTENANCE MANUALS

A. See General Conditions and the General Requirements in Division 01 regarding Operating and Maintenance Manuals.

B. Submit maintenance manuals to the Engineer covering all equipment, devices, etc. installed by the Contractor.

C. The operation and maintenance manuals shall be submitted by specification section complete and all at one time; partial operations and maintenance manual submittals will not be considered. The Operation and maintenance manuals shall be provided in electronic PDF Format. The data in the electronic file shall be arranged and indexed under basic categories. An index shall be included with bookmarks and identifying tabs between sections and references to sections of specifications. The manual shall contain, but not limited to, the following types of information:

1. Cover sheet with name, address, telephone number of Contractor, General Contractor and major equipment suppliers.
2. Catalog cuts of all equipment, etc. installed (Marked to identify the specific items used).
3. Manufacturer's maintenance and overhaul instruction booklets including exploded views.
4. Identification numbers of all parts and nearest sources for obtaining parts and services.
5. Reduced scale drawings of the control system and a verbal description of how these controls operate.
6. A copy of the final test and balance report.
7. A copy of valve schedule and reduced scale drawings showing valve locations.
8. Written summary of instructions to Owner.
9. All manufacturers' warranties and guarantees.
10. Contractors Warranty Letter.

D. A periodic maintenance form that includes all of the equipment shall be provided with the maintenance manual. The form shall list each piece of equipment and how often maintenance is required (daily, weekly, monthly, annually). Opposite each task shall be squares for check-off for a full year (initials) to verify that the tasks are being done.

1.8 HANDLING

A. See General Conditions and the General Requirements in Division 01 regarding material handling.

B. Deliver packaged materials to job site in unbroken packages with manufacturer's label, and store to facilitate inspection and installation sequence. All items must be labeled and identified as to make, size and quality.

1.9 SUBSTITUTIONS

A. See General Conditions and the General Requirements in Division 01 for substitution request procedures.

B. In accordance with the General Conditions and the General Requirements in Division 01, Substitution and Product Options, all substitute items must fit in the available space, and be of equal or better quality including efficiency performance, size, and weight, and must be compatible with existing equipment. The Owner shall be the final authority regarding acceptability of substitutes.

1.10 DIMENSIONS

A. Before ordering any material or doing any work, the Contractor shall verify all dimensions, including elevations, and shall be responsible for the correctness of the same. No extra charge or compensation will be allowed on account of differences between actual dimensions and measurements indicated on the drawings.

B. Any differences, which may be found, shall be submitted to the Owner for consideration before proceeding with the work.

1.11 MANUFACTURER'S DIRECTIONS

A. All manufactured articles shall be applied, installed and handled as recommended by the manufacturer, unless specifically called out otherwise. Advise the Architect/Engineer of any such conflicts before installation.

1.12 PERMITS, FEES, ETC.

A. The Contractor under each Division of these specifications shall arrange for a permit from the local authority. The Contractor shall pay for any inspection fees or other fees and charges required by ordinance, law, codes and these specifications.

1.13 TESTING

A. The Contractor under each section shall perform the various tests as specified and required by the Architect, Engineer and as required by applicable code, the State and local authorities. The Contractor shall furnish all labor, fuel and materials necessary for making tests.

1.14 TERMINOLOGY

A. Whenever the words "furnish", "provide", "furnish and install", "provide and install", and/or similar phrases occur, it is the intent that the materials and equipment described be furnished, installed and connected under this Division of the Specifications, complete for operation unless specifically noted to the contrary.

B. Where a material is described in detail, listed by catalogue number or otherwise called for, it shall be the Contractor's responsibility to furnish and install the material.

C. The use of the word "shall" conveys a mandatory condition to the contract.

D. "This section" refers to the section in which the statement occurs.

E. "The project" includes all work in progress during the construction period.

F. In describing the various items of equipment, in general, each item will be described singularly, even though there may be a multiplicity of identical or similar items.

1.15 SCHEDULE OF WORK

A. The work under the various sections must be expedited and close coordination will be required in executing the work. The various trades shall perform their portion of the work at such times as directed so as to meeting scheduled completion dates, and to avoid delaying any other trade. The Architect will set up completion dates. Each contractor shall cooperate in establishing these times and locations and shall process work so as to ensure the proper execution of it.

1.16 COOPERATION AND CLEANING UP

A. The Contractor for the work under each section of the specifications shall coordinate the Contractors work with the work described in all other sections of the specifications to the end that, as a whole, the job shall be a finished one of its kind, and shall carry on the work in such a manner that none of the work under any section of these specifications shall be handicapped, hindered or delayed at any time.

B. At all times during the progress of the work, the Contractor shall keep the premises clean and free of unnecessary materials and debris. The Contractor shall, on direction at any time from the Architect, clear any designated areas or area of materials and debris. On completion of any portion of the work, the Contractor shall remove from the premises all tools and machinery and all debris occasioned by the work, leaving the premises free of all obstructions and hindrances.

1.17 WARRANTY

A. Unless a longer warranty is hereinafter called for, all work, materials and equipment items shall be warrantied for a period of one year after acceptance by the Owner. All defects in labor and materials occurring during this period, as determined by the Architect/Engineer, shall be repaired and/or replaced to the complete satisfaction of the Architect/Engineer. Guarantee shall be in accordance with Division 01.

1.18 COMPLETION REQUIREMENTS

A. In accordance with the General Conditions and the General Requirements in Division 01, Project Closeout; before acceptance and final payment, the Contractor shall furnish:

1. Accurate project record drawings, shown in red ink on prints, showing all changes from the original plans made during installation of the work.
2. Contractors One Year Warranty.
3. All Manufacturers' Guarantees.
4. Test and Balance Reports.
5. Operation and Maintenance Manuals.

1.19 INSPECTION OF SITE - REMODEL PROJECTS

A. The accompanying plans do not indicate completely the existing plumbing and mechanical installations. The bidders for the work under these sections of the specifications shall inspect the existing installations and thoroughly acquaint themselves with conditions to be met and the work to be accomplished in removing and modifying the existing work, and in installing the new work in the present building and underground serving to and from that structure. Failure to comply with this shall not constitute grounds for any additional payments in connection with removing or modifying any part of the existing installations and/or installing any new work.

1.20 RELOCATION OF EXISTING INSTALLATIONS

A. There are portions of the existing plumbing, mechanical and electrical systems, which shall remain in use to serve the finished building in conjunction with the indicated new installations. By actual examination at the site, each bidder shall determine those portions of the remaining present installations, which must be relocated to avoid interference with the installations of new work of the Contractors particular trade and that of all other trades. All such existing installations, which interfere with new installations, shall be relocated by the Contractor.

1.21 SALVAGE MATERIALS

A. The Contractor shall remove existing equipment, duct, grilles and other items associated with the mechanical systems where no longer required for the project. Where such items are exposed

to view or uncovered by any cutting or removal of general construction and has no continuing function (as determined by the Architect/Engineer), they shall be removed.

B. All items or materials removed from the project shall be made available for the Owner's inspection. The Owner retains the option to claim any item or material. Contractor shall deliver any claimed item or material in good condition to the place designated by the Owner. All items not claimed become the property of the contractor and shall be removed from the site.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All equipment shall be regularly cataloged items of the manufacturer and shall be supplied as a complete unit in accordance with the manufacturer's standard specifications along with any optional items required for proper installation unless otherwise noted. Maintain manufacturer's identification, model number, etc. on all equipment at all times.

B. Where more than one of an item is to be provided, all of the items shall be identical manufacture, make, model, color, etc.

2.2 RESTRICTED MATERIALS

A. No materials containing asbestos in any form shall be allowed.

B. No solder or flux containing lead shall be used on this project.

C. Where materials or equipment provided by this Contractor are found to contain restricted materials, such items shall be removed and replaced with non-restricted materials items. Entire cost of restricted materials removal and disposal and cost of installing new items shall be the responsibility of the Contractor for those restricted materials containing items installed by the Contractor.

2.3 ELECTRICAL MOTORS

A. Motors: Furnish electric motors designed for the specific application and duty applied, and to deliver rated horsepower without exceeding temperature ratings when operated on power systems with a combined variation in voltage and frequency not more than + 10% of rated voltage. Motors for pumps and fans shall be selected to be non-overloading.

B. Verify from the drawings and specifications the available electrical supply characteristics and furnish equipment that will perform satisfactorily under the conditions shown and specified.

C. All motors for use with equipment with variable frequency drives shall be inverter ready motors. Verify compatibility and sizing of motor with variable frequency drive.

D. Size motors for 1.15 service factor and not to exceed 40º C temperature rise above ambient.

E. Fractional horsepower motors to have self-resetting thermal overload switch.

2.4 IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

A. Plastic Nameplates: Laminated plastic with engraved letters.

B. Plastic Tags: Laminated plastic with engraved letters, minimum 1-1/2 inches diameter.

C. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering.

D. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.

2.5 HANGER RODS

A. Steel Hanger Rods: Threaded both ends, or continuous threaded.

2.6 SLEEVES

A. Sleeves for Pipes Through Fire Rated and Fire Resistive Floors and Walls, and Fireproofing: UL listed caulking system.

B. Fire Stopping Insulation: Mineral fiber type, non- combustible.

C. Caulk: Fire stop sealant in compliance with ASTM E814, UL 1479 and Division 07.

2.7 FORMED STEEL CHANNEL

A. Manufacturers:

1. Allied Tube & Conduit Corp.
2. B-Line Systems.
3. Midland Ross Corporation, Electrical Products Division
4. Unistrut Corp.
5. Substitutions under provisions of Division 01.

B. Product Description: Galvanized 12 gauge (2.8 mm) thick steel. With holes 1-1/2 inches (38 mm) on center.

PART 3 - EXECUTION

3.1 DRAWINGS

A. The drawings are partly diagrammatic, not necessarily showing all offsets or exact locations of piping and ducts, unless specifically dimensioned. The contractor shall provide all materials and labor necessary for a complete and operable system. Complete details of the building which affect the mechanical installation may not be shown. For additional details, see Architectural and Electrical Drawings. Coordinate work under this section with that of all related trades.

3.2 INSTALLATION

A. All work shall comply with the latest adopted applicable codes and ordinances including, but not limited to, the IMC, UPC, IBC, NEC, NFPA, IECC, IFGC and IFC Standards; all local and state amendments to all codes and standards.

B. Obtain and pay for all inspection fees, connection charges and permits as a part of the Contract.

C. Compliance with codes and ordinances shall be at the Contractor's expense.

D. Install in accordance with manufacturer's instructions.

3.3 MEASUREMENTS

A. Verify all measurements on the job site.

B. Locate all equipment on the centers of walls, openings, spaces, etc., unless specified otherwise.

C. Check all piping, ducts, etc. to clear openings.

D. Rough-in dimensions shall be per manufacturer's recommendations and in compliance with current ADA and ANSI 117.1 standards.

3.4 OPERATING INSTRUCTIONS

A. Before the facility is turned over to the Owner, instruct the Owner or Owner's personnel in the operation, care and maintenance of all systems and equipment under the jurisdiction of the Mechanical Division. These instructions shall also be included in a written summary in the Operating Maintenance Manuals.

B. The Operation and Maintenance Manuals shall be utilized for the basis of the instruction. Provide a minimum of four hours of on site instruction to the owner designated personnel.

C. When required by individual specification sections provide additional training on HVAC systems and equipment as indicated in the respective specification section.

D. Provide schedule for training activities for review prior to start of training.

3.5 CUTTING, FITTING, REPAIRING, PATCHING AND FINISHING

A. Arrange and pay for all cutting, fitting, repairing, patching and finishing of work by other trades where it is necessary to disturb such work to permit installation of mechanical work. Perform work only with craftsmen skilled in their respective trades.

B. Avoid cutting, insofar as possible, by setting sleeves, frames, etc. and by requesting openings in advance. Assist other trades in securing correct location and placement of rough-frames, sleeves, openings, etc. for ducts and piping.

C. Cut or core all holes neatly and as small as possible to admit work. Include cutting where sleeves or openings have been omitted. Perform cutting in a manner so as not to weaken walls, partitions or floors. Drill holes required to be cut in floors without breaking out around holes.

3.6 PAINTING

A. Perform all of the following painting in accordance with provisions of Division 09 with colors as selected by the Architect. Provide the following items as a part of mechanical work:

1. Factory applied prime and finish coats on mechanical equipment.
2. Factory applied prime and finish coat on all air registers, grilles and diffusers, unless otherwise specified.
3. Factory applied prime coat on access doors.
4. Pipe identification where specified.

B. If factory finish on any equipment furnished is damaged in shipment or during construction, refinish to equal original factory finish.

3.7 IDENTIFICATION

A. Tag all valves with heat resistant laminated plastic labels or brass tags engraved with readily legible letters. Securely fasten to the valve stem or bonnet with beaded chain. Provide a framed, typewritten directory under glass, and installed where directed. Provide complete record drawings that show all valves with their appropriate label. Seton 250-BL-G, or 2961.20-G, 2” round or equal.

B. Label all equipment with heat resistant laminated plastic labels having engraved lettering ½" high. If items are not specifically listed on the schedules, consult the Engineer concerning designation to use. Seton engraved Seton-Ply nameplates or equal.

C. Identify piping to indicate contents and flow direction of each pipe exposed to view by a labeled sleeve in letters readable from floor at least once in each room and at intervals of not more that 20' apart and on each side of partition penetrations. Coloring scheme in accordance with ANSI A13.1-1981, Seton Opti-Code or equal.

3.8 INSTALLATION OF EQUIPMENT

A. Unless otherwise indicated, mount all equipment and install in accordance with manufacturer's recommendations and approved submittals.

B. Maintain manufacture recommended minimum clearances for access and maintenance.

C. Where equipment is to be anchored to structure, furnish and locate necessary anchoring and vibration isolation devices.

D. Furnish all structural steel, such as angles, channels, beams, etc. required to support all piping, ductwork, equipment and accessories installed under this Division. Use structural supports suitable for equipment specified or as indicated. In all cases, support design will be based upon data contained in manufacturer's catalog.

E. Openings: Arrange for necessary openings in buildings to allow for admittance and reasonable maintenance or replacement of all equipment furnished under this Contract.

F. Access Doors: Provide as necessary for reasonable maintenance of all equipment valves, controls, etc.

END OF SECTION 23 05 00

SECTION 23 05 93 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Air Systems:

1. Constant Volume Air Systems.

1.2 SCOPE

A. Furnish the professional services of a qualified and approved balancing and testing firm to perform the work of this specification section.

B. The work of this section is for equipment installed under this contract:

1. Testing and balancing transfer fans systems.

1.3 APPLICABLE CODES AND STANDARDS

A. SMACNA Manual for the Balancing and Adjustment of Air Distribution Systems.

B. AMCA Publication 203, Field Performance Measurements.

C. American Air Balancing Council (AABC) Recommended Procedures

D. National Environmental Balancing Bureau (NEBB) Recommended Procedures

1.4 QUALIFICATION OF THE BALANCING FIRM OR COMPANY

A. Subcontractor minimum qualifications include:

1. NEBB Certified in Testing, Adjusting and Balancing of Air and Hydronic Systems or Demonstration of satisfactory completion of five projects of similar scope in the State of Alaska during the past five years. Provide references if requested.

1.5 TIMING OF WORK

A. Do not begin balancing and testing until the systems, including controls, are completed and in full working order.

B. Schedule the testing and balancing work in cooperation with other trades.

C. Complete the testing and balancing at least one week before the date of substantial completion and before any occupancy occurs

1.6 CONTRACTOR RESPONSIBILITY TO BALANCING AGENCY

A. Award the test and balance contract to an approved firm or company upon receipt of contract to allow the Balance and Testing Agency to schedule this work in cooperation with other trades involved and comply with completion date.

B. Put all ventilating systems, equipment and controls into full operation for the Balancing Agency and continue the operation of same during each working day of testing balancing.

C. Provide scaffolding, ladders and access to each system for proper testing balancing.

D. Ensure that the building enclosure is complete, including but not limited to, structural components, windows and doors installed, door hardware complete, ceilings complete, stair, elevator and mechanical shafts complete, roof systems complete, all plenums sealed, etc.

E. Make any changes in pulleys, belts and dampers, or add any dampers as required for correct balance as recommended by the Balance and Testing Agency at no additional cost to the Owner.

F. Complete installation, programming (including design parameters and graphics), calibration, and startup of all building control systems.

G. Require that the building control system firm provide access to hardware and software, or onsite technical support required to assist the TAB effort. The hardware and software or the onsite technical support shall be provided at no cost to the TAB firm.

1.7 REPORT

A. Certified Reports shall be included in project O & M manuals. Reports shall include: testing, adjusting, and balancing reports bearing the signature of the Test and Balance Agency Representative. The reports shall be certified proof that the systems have been tested, adjusted, and balanced in accordance with the referenced standards; are an accurate representation of how

the systems have been installed; are a true representation of how the systems are operating at the completion of the testing, adjusting and balancing procedures; and are an accurate record of all final quantities measured, to establish normal operating values of the system. Follow the procedures and format specified below:

1. Draft Reports: Upon completion of testing, adjusting and balancing procedures, prepare draft reports on the approved forms. Draft reports may be hand written, but must be complete, factual, accurate, and legible. Organize and format draft reports in the same manner specified for the final reports.
2. Final Reports: Upon verification and approval of the draft report; prepare final reports, typewritten, organized and formatted as specified below.
3. Report Format: Report forms shall be those standard forms prepared by the referenced standard for each respective item and system to be tested, adjusted and balanced. Report shall be provided in electronic PDF Format. The data in the electronic file shall be arranged and indexed. Divide the contents into the below listed sections, with bookmarks for each section:

    a. General Information and Summary.
    b. Air Systems.
    c. System Deficiency Reports and Corrective Actions.

4. Report Contents: Provide the following minimum information, forms and data:

    a. General Information and Summary: Inside cover sheet to identify testing, adjusting, and balancing agency; contractor; owner, architect, engineer and project. Include addresses, contact names and telephone numbers. Also, include a certification sheet containing the name, address, telephone number and signature of the Certified Test and Balance Personnel. Include in this division a listing of the instrumentation used for the procedures along with the proof of calibration.
    b. The remainder of the report shall contain the appropriate forms containing as a minimum, the information indicated on the standard report forms prepared by the AABC for each respective item and system. Prepare a schematic diagram for each item of equipment and system to accompany each respective report form.
    c. Calibration Reports: Submit proof that all required instrumentation has been calibrated to tolerances specified in the referenced standards, within a period of six months prior to starting the project.

1.8 SUBMITTALS

A. Submit in accordance with Division 01.

B. Submit balancing agency qualifications and sample balancing forms.

C. Provide list of equipment to be used and date of last calibration.

D. Submit preliminary balance report a minimum of one week prior to substantial completion inspection.

PART 2 - PRODUCTS

2.1 INSTRUMENTS

A. Maintain all instruments accurately calibrated and in good working order. Use instruments with the following minimum performance characteristics.

1. Air Velocity Instruments: Direct reading in feet per minute, 2% accuracy.
2. Static Pressure Instruments: Direct reading in inches' water gauge, 2% accuracy.
3. RPM Instruments: Direct reading in revolutions per minute, .5% accuracy; or revolution counter accurate within 2 counts per 1,000.
4. Pressure Readout: Direct reading in feet of water or PSI, .5% accuracy.
5. Temperature Instruments - Direct reading in degrees F, +.5% accuracy.
6. Sound Measuring Instrument: Octave Band Analyzer which essentially complies to AASA Standards SI.6 1960 with a range of 24DB to 150 DB sound pressure level ref. .0002 microbar. Calibrate sound test instrument before use to a closed coupler and a driving loudspeaker that produces a know-sound pressure level at the microphone of the analyzer.

PART 3 - EXECUTION

3.1 GENERAL PROCEDURES FOR ALL SYSTEMS

A. Start with new, clean filters.

B. In cooperation with the control manufacturer's representative, coordinate adjustments of automatically operated dampers and valves to operate as specified, indicated and/or noted.

C. Use manufacturer's ratings on all equipment to make required calculations.

D. Make final adjustments for each space per heating or cooling comfort requirement. State reason for variance from design CFM, i.e., "too noisy", "drafty", etc.

E. Mark equipment and balancing device settings (including damper-control positions, valve position indicators, fan-speed-controls, and similar controls and devices) with paint or other suitable permanent identification material to show final settings.

3.2 REQUIREMENTS FOR ALL AIR HANDLING SYSTEMS

A. Identify each diffuser, grille and register as to location and area.

B. Identify and list size, type and manufacturer of diffusers, grilles, registers and all testing equipment.

C. In readings and tests of diffusers, grilles and registers, include required FPM velocity and required CFM and test CFM after adjustments. If test apparatus is designed to read CFM directly, velocity reading may be omitted. Identify test apparatus used. Identify wide open (W.O.) runs.

D. Check and record the following items:

1. Air temperatures; return air and supply air.
2. Full nameplate data of all equipment.
3. Rated and actual running amperage and voltage of all motors.
4. Drive data including sheaves and belts and adjustments.
5. Electrical overloads/heaters sizes and ranges of motors.

3.3 BALANCING LOW VELOCITY CONSTANT VOLUME DUCTWORK

A. Adjust the fan for design airflow.

B. Read and record the airflow at each inlet and outlet.

C. Set final fan speed with speed controller.

END OF SECTION 23 05 93

SECTION 23 09 00 - INSTRUMENTATION AND CONTROL FOR HVAC

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Electric Control System.

B. Thermostats.

1.2 RELATED SECTIONS

A. Section 23 09 93 - Sequence of Operation for HVAC Controls.

1.3 REFERENCES

A. National Electrical Manufacturers Association:

1. NEMA DC 3 - Residential Controls - Electrical Wall Mounted Room Thermostats.

B. National Fire Protection Association:

1. NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems.

1.4 SUBMITTALS

A. Submit shop drawings under provisions of Division 01.

B. Submit product data under provisions of Division 01.

C. Product Data: Include list which indicates use, operating range, total range and location for manufactured components.

D. Submit manufacturer's installation instructions under provisions of Division 01.

1.5 PROJECT RECORD DOCUMENTS

A. Submit documents under provisions of Division 01.

B. Accurately record actual locations of instrumentation.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Do not install instrumentation when areas are under construction, except for required rough-in, taps, supports and test plugs.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS – THERMOSTATS

A. Honeywell.

B. Siemens.

C. Johnson.

D. Belimo.

E. Substitutions: Under provisions of Section Division 01.

2.2 LOW VOLTAGE THERMOSTATS

A. Digital 24 vac voltage thermostat: 7 day programming, digital display, menu-drive, precise temperature control (+/-1 degree F), battery backup, 40 F to 85 F set point range, hardwired power.

2.3 LINE VOLTAGE THERMOSTATS

A. Line voltage thermostat compatible with unit heaters and cabinet unit heaters.

2.4 CONTROL RELAYS

A. General: Provide relays rated for current and voltage requirements of controlled equipment.

B. Panel Mounted Relays:

C. Plug in type, with DIN rail mountable plug in sockets. IDEC RH series or equal.

D. UL listed.

E. Field Mounted Relays:

F. Solid state packaged relay including relay, LED indicator, provisions for mounting, transient protection and housing. Functional Devices RIB T series or equal.

G. Provide with a Hand-Off-Auto switch.

H. Provide internal separation between class 1 and class 2 wiring including separate wire ways or nipples.

I. UL listed.

2.5 WIRING AND RACEWAYS

A. Provide wiring and raceway complying with the National Electrical Code, Division 26, and State and Local Codes and Ordinances, with the following exception:

B. The minimum size of conduit shall be 1/2". This shall apply to conduit and cabling operating at voltages less than 48V.

C. Raceways:

1. EMT, metal duct, IMC, surface metal raceways, or totally enclosed metal trough with flexible metal tubing unless otherwise noted.
2. Provide rigid steel conduit raceways when raceway is buried or embedded in concrete.
3. Provide 18 inches minimum to 36 inches maximum flexible metal conduit of galvanized steel construction for final connection to control devices. For connections to pipe mounted devices, and to devices in damp, wet, or exterior locations, or in mechanical rooms containing boilers or steam converters, provide oil-resistant liquid-tight flexible metal conduit.
4. Provide EMT connectors with rain tight compression fittings and insulated throats.
5. Wire mould is generally not allowed except as approved on a case-by-case basis with the owner's representative.

D. Wiring:

1. Provide wire with copper stranded conductors. Provide color or number coded jackets.
2. Low voltage wiring from control components to input/output modules: 20 gauge minimum foil-shielded cable rated 100 VDC at 80 deg C.
3. Provide plenum rated cable whenever wire is run without conduit.
4. Provide communications network wiring meeting the gauge, impedance, capacitance, resistance and shielding requirements specified by the manufacturer of the connected devices.
5. Identify wires and cables with permanent self-laminating machine print labeling system. Provide labels capable of receiving 8 characters of type written text, with minimum print on area of 1 inch by 1/2 inch, and protected by a clear sheath. Thomas & Betts E-Z Code or equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Provide proper grounding of all control wiring.

3.2 IDENTIFICATION

A. All controllers, transmitters, switches, thermostats, gauges, and devices with adjustable setpoints shall be permanently tagged for identification.

B. The tagging scheme shall be reflected on the control drawings. Also, include plain language label.

3.3 POWER AND INTERFACE CONNECTIONS

A. Coordinate fully with other Divisions of this specification to provide all necessary power connections and interface connections for a complete and fully operable control system.

B. Electric wiring and wiring connection required for the installation of the control system as herein specified shall be provided by the Controls Contractor.

C. Line voltage wiring shall be installed in raceways. .

D. Low voltage wiring shall be physically protected and installed in raceways.

E. All wiring shall comply with the requirements of local and national electrical codes and with Division 26.

F. All wiring and conduit shall be installed by qualified personnel with electrical certificate of fitness.

3.4 WIRING AND RACEWAYS

A. Permanently label electrical or electronic wiring at each end indicating location and the device at opposite end. At the direct digital controller end use either the I/O address, if it describes the connected device, or the unique control device tag used on the control schematics. At the device end indicate both the terminal number and the controller connected at the other end. For color coded multi-conductor cable, label cable sheath not individual conductors.

B. At field devices where conductors are not wired to terminal strips wire using a unique color for each conductor connected to that device.

C. Install wiring in a neat and orderly manner generally running along building lines.

D. Support low voltage wiring run without conduit at a maximum of 4 feet between anchors.

E. Seal conduit penetrations at floor and wall penetrations with firestopping installed as indicated. Note that this applies to all floor and wall penetrations, not just fire barrier penetrations. At all mechanical rooms or other rooms containing floor drains, except those with slab on grade floors, make penetration watertight and extend sleeve 3 inches above the floor.

F. Wire all electrical controls and switches furnished under this Section of the Specifications.

G. Make wire connections using factory fabricated jack assemblies, terminal strips, or solder connections. Use crimp connectors on stranded wire unless connecting to terminal strips approved for direct stranded wire connection. Insulate solder connections with heat shrink tubing. Field connections in control power wiring circuits may be made using wire nuts.

H. Avoid splices in signal wire, where unavoidable connect with solder connections and label on each side of splice. Use identical wire type and color on each side of splice.

I. Conceal wiring in finished areas. Unless otherwise noted, install wiring inside conduit or fully enclosed metallic raceway.

J. Low voltage wiring installed in concealed accessible locations may be run without conduit. Sleeve wiring at wall penetrations.

K. Metal raceways crossing expansion joints make provision for 3 way movement. For conduits 1 & 1/2 inch and larger use O-Z type DX fittings, or equal.

L. At raceway penetrations of the vapor barrier provide a double splice patch (one on each side of vapor barrier) by cutting a square piece of vapor barrier 12 inches larger on all sides than the pipe. Cut a round hole in the center of the square splice patch, smaller than the pipe, to form a stretched fit. Force the pipe through the splice patch and tape all sides to the vapor barrier and seal the vapor barrier to the pipe at the penetration with an adhesive compatible with the vapor barrier material.

M. Securely seal at both ends, raceways running from a warm area to a cold area. Ductseal or equal.

N. Install all wiring in accordance with National Electrical Code, and State and Local Codes and Ordinances.

3.5 INSTRUCTION AND ADJUSTMENT

A. Upon completion of the project, the controls contractor shall adjust and validate all thermostats, controllers, damper operators, relays, etc. provided under this section, or where sequence is listed, he shall validate and calibrate controls provided by others.

B. Instruction manuals shall be provided by the controls contractor and approved by the Engineer. Such manuals shall cover the function and operation of the control system on the project for use by the Owner's operating personnel. Such manuals shall be used in conjunction with two (2) hours of on-site instruction to familiarize operating personnel with the control system. The required instruction shall consist of a "classroom" period and a "field" period.

1. The classroom portion shall cover:

    a. Preventive maintenance procedures.
    b. A brief description of the controls' sequence of operation.
    c. A discussion and explanation of all alarms, switches, and gauges.
    d. A summary and brief explanation of steps to be taken for specific alarm or control malfunctions.

2. The field portion shall consist of a building walk- through to physically locate and examine all control devices, and demonstrations on control setpoint adjustment procedures. Adjusting procedures should emphasize methods for continual building "fine-tuning." Also, demonstrate all controls sequences to the Owner and Engineer on final acceptance.

C. The controls contractor shall provide a complete controls maintenance section for inclusion in the mechanical maintenance manuals. This shall include as-built control diagrams, Sequence of Operation, control parts list, equipment data sheets, preventive maintenance requirements and schedules, and the above-mentioned instruction manual.

D. At the instruction period, a one (1) year "In Warranty" maintenance agreement shall be presented to Owner's Representative.

3.6 WARRANTY

A. Upon completion of the project, as defined either by acceptance of the building by the Owner or use of the equipment by the Owner for its intended purposes - whichever occurs first, a warranty period of one (1) year shall commence. The warranty shall consist of a commitment by the controls contractor to provide, at no cost to the Owner, parts and labor as required to repair or replace such parts of the control system that prove inoperative due to defective materials or installation practices. This warranty expressly excludes routine service, such as instrument calibration.

END OF SECTION 23 09 00

SECTION 23 09 93 - SEQUENCE OF OPERATIONS FOR HVAC CONTROLS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Transfer Fans.

B. Elevator Sump Pump.

C. Sump Pump.

1.2 RELATED SECTIONS

A. Section 23 05 00 - Common Work Results for HVAC.

B. Section 23 09 23 - Direct Digital Control System for HVAC.

1.3 SYSTEM DESCRIPTION

A. This Section defines the manner and method by which controls function. Requirements for each type of control system operation are specified. Equipment, devices, and system components required for control systems are specified in other Sections.

1.4 SUBMITTALS

A. Submit under provisions of Division 01.

B. Submit diagrams indicating mechanical system controlled and control system components. Label with settings, adjustable range of control and limits. Include written description of control sequence.

C. Include flow diagrams for each control system, graphically depicting control logic.

D. Include draft copies of graphic displays indicating mechanical system components, control system components, and controlled function status and value.

1.5 PROJECT RECORD DOCUMENTS

A. Submit documents under provisions of Division 01.

B. Accurately record actual setpoints and settings of controls, including changes to sequences made after submission of shop drawings.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

3.1 TRANSFER FAN (TF-1)

A. Alarms:

1. High temp Alarm (>85F).

B. Manual Control and Indication:

1. H-O-A Control.
2. On-off Indication.

C. Automated Control:

1. Fan will turn on upon receiving input from reverse acting thermostat to lower temperature in room.
2. The existing DDC sensor shall be utilized to provide temperature trend data and high temperature alarm.

3.2 ELEVATOR SUMP PUMP (PMP-40)

A. Alarms:

1. High level.

B. Manual Control and Indication:

1. H-O-A Control.
2. On-off indication.

C. Automated Control:

1. Pump will operate to maintain water level as determined by Control Panel and float sensor.
2. High level alarm will initiate at water level above second high level float sensor.

3.3 SUMP PUMP (PMP-33)

A. Alarms:

1. None.

B. Manual Control and Indication:

1. None.

C. Automated Control:

1. Pump will operate to maintain water level by integral float.

END OF SECTION 23 09 93

SECTION 23 31 00 - HVAC DUCTS AND CASINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Duct Materials.

1.2 RELATED SECTIONS

A. Section 23 07 00 - HVAC Insulation: Product requirements for duct liners for placement by this section.

B. Section 23 33 00 - Air Duct Accessories: Product requirements for duct accessories for placement by this section.

1.3 REFERENCES

A. ASTM International:

1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
2. ASTM A90/A90M - Standard Test Method for Weight Mass of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
3. ASTM A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
4. ASTM A568/A568M - Standard Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for.
5. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
6. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
7. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.

B. National Fire Protection Association:

1. NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems.

C. Sheet Metal and Air Conditioning Contractors:

1. SMACNA - HVAC Air Duct Leakage Test Manual.
2. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

D. Underwriters Laboratories Inc.:

1. UL 181 - Factory-Made Air Ducts and Connectors.

1.4 DEFINITIONS

A. Duct Sizes: Inside clear dimensions. For lined ducts, maintain sizes inside lining.

B. Low Pressure: Three pressure classifications: ½ inch WG positive or negative static pressure and velocities less than 2,000 fpm; 1 inch WG positive or negative static pressure and velocities less than 2,500 fpm and 2 inch WG positive or negative static pressure and velocities less than 2,500 fpm.

C. Medium Pressure: Three pressure classifications: 3 inch WG positive or negative static pressure and velocities less than 4,000 fpm, 4 inch WG positive static pressure and velocities greater than 2,000 fpm, 6 inch WG positive static pressure and velocities greater than 2,000 fpm.

D. High Pressure: 10 inch WG positive static pressure and velocities greater than 2,000 fpm.

1.5 PERFORMANCE REQUIREMENTS

A. Variation of duct configuration or sizes other than those of equivalent or lower loss coefficient is not permitted except by written permission. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts.

1.6 SUBMITTALS

A. See General Conditions and the General Requirements in Division 01 regarding submittals.

B. Product Data: Submit data for duct materials.

C. Test Reports: Indicate pressure tests performed. Include date, section tested, test pressure, and leakage rate, following SMACNA HVAC Air Duct Leakage Test Manual.

D. Manufacturer's Installation Instructions: Submit special procedures for glass fiber ducts.

1.7 CLOSEOUT SUBMITTALS

A. Division 01 - Execution and Closeout Requirements: Closeout procedures.

B. Project Record Documents: Record actual locations of ducts and duct fittings. Record changes in fitting location and type. Show additional fittings used.

1.8 QUALITY ASSURANCE

A. Perform Work in accordance with SMACNA - HVAC Duct Construction Standards - Metal and flexible.

B. Maintain one copy of each document on site.

1.9 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing Work of this section with minimum three years experience.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Division 01 - Product Requirements.

B. Do not install duct sealant when temperatures are less than those recommended by sealant manufacturers.

C. Maintain temperatures during and after installation of duct sealant.

1.11 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.12 WARRANTY

A. Division 01 - Execution and Closeout Requirements: Product warranties and product bonds.

PART 2 - PRODUCTS

2.1 DUCT MATERIALS

A. Galvanized Steel Ducts: ASTM A653/A653M galvanized steel sheet, lock-forming quality, having G90 zinc coating of in conformance with ASTM A90/A90M.

B. Fasteners: Rivets, bolts, or sheet metal screws.

C. Hanger Rod: ASTM A36/A36M; steel;threaded both ends, threaded one end, or continuously threaded.

2.2 LOW PRESSURE DUCTWORK FABRICATION

A. Fabricate and support rectangular ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible and ASHRAE handbooks, except as indicated. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.

B. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts. No variation of duct configuration or sizes permitted except by written permission.

C. Construct T's, bends, and elbows with minimum radius 1-1/2 times centerline duct width. Where not possible and where rectangular elbows are used, provide airfoil turning vanes.

D. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30° divergence upstream of equipment and 45°convergence downstream.

E. Provide standard 45-degree lateral wye takeoffs. When space does not allow 45-degree lateral wye takeoff, use 90-degree conical tee connections.

F. Provide easements where low pressure ductwork conflicts with piping and structure. Where easements exceed 10 percent duct area, split into two ducts maintaining original duct area.

G. Use crimp joints with or without bead for joining round duct sizes 12” and smaller with crimp in direction of airflow.

H. Use double nuts and lock washers on threaded rod supports.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Division 01 - Administrative Requirements: Coordination and project conditions.

B. Verify sizes of equipment connections before fabricating transitions.

3.2 INSTALLATION

A. During construction, install temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.

B. Install duct hangers and supports in accordance with Section 23 05 00.

C. Use double nuts and lock washers on threaded rod supports.

3.3 SCHEDULES

A. Ductwork Material Schedule:

Air System	Material
Low Pressure Supply	Steel

END OF SECTION 23 31 00

SECTION 23 33 00 - AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fire Dampers.
2. Control Dampers.

1.2 RELATED SECTIONS

A. Section 23 09 23 - Direct-Digital Control System for HVAC: Execution and Product requirements for connection and control of Combination Smoke and Fire Dampers for placement by this section.

B. Section 23 31 00 - HVAC Ducts and Casings: Requirements for duct construction and pressure classifications.

1.3 REFERENCES

A. Air Movement and Control Association International, Inc.:

1. AMCA 500 - Test Methods for Louvers, Dampers, and Shutters.

B. ASTM International:

1. ASTM E1 - Standard Specification for ASTM Thermometers.

C. National Fire Protection Association:

1. NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems.
2. NFPA 92A - Recommended Practice for Smoke-Control Systems.

D. Sheet Metal and Air Conditioning Contractors:

1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

E. Underwriters Laboratories Inc.:

1. UL 555 - Standard for Safety for Fire Dampers.

1.4 SUBMITTALS

A. Division 01 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit data for shop fabricated assemblies and hardware used.

C. Product Data: Submit for the following.

1. Fire dampers including locations and ratings.
2. Control dampers.

D. Product Data: For fire dampers submit the following:

1. Include UL ratings, dynamic ratings, leakage, pressure drop and maximum pressure data.
2. Indicate materials, construction, dimensions, and installation details.
3. Damper pressure drop ratings based on tests and procedures performed in accordance with AMCA 500.

E. Manufacturer's Installation Instructions: Submit for Fire Dampers.

F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.5 CLOSEOUT SUBMITTALS

A. Division 01 - Execution and Closeout Requirements: Closeout procedures.

B. Project Record Documents: Record actual locations of access doors and test holes

C. Operation and Maintenance Data: Submit for Combination Smoke and Fire Dampers.

1.6 QUALITY ASSURANCE

A. Dampers tested, rated and labeled in accordance with the latest UL requirements.

B. Damper pressure drop ratings based on tests and procedures performed in accordance with AMCA 500.

C. Maintain one copy of each document on site.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Division 01 - Product Requirements: Product storage and handling requirements.

B. Protect dampers from damage to operating linkages and blades.

C. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly indicating manufacturer and material.

D. Storage: Store materials in a dry area indoor, protected from damage.

E. Handling: Handle and lift dampers in accordance with manufacturer's instructions. Protect materials and finishes during handling and installation to prevent damage.

1.9 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.10 COORDINATION

A. Division 01 - Administrative Requirements: Coordination and project conditions.

B. Coordinate Work where appropriate with building control Work.

1.11 WARRANTY

A. Division 01 - Execution and Closeout Requirements: Product warranties and product bonds.

1.12 EXTRA MATERIALS

A. Division 01 - Execution and Closeout Requirements: Spare parts and maintenance products.

B. Furnish two of each size and type of fusible link.

1.13 COMPLETION REQUIREMENTS

A. In accordance with the General Conditions and the General Requirements in Division 01, Project Closeout; before acceptance and final payment, the Contractor shall furnish:

1. Accurate project record drawings, shown in red ink on prints, showing all changes from the original plans made during installation of the work.
2. Contractors One Year Warranty.
3. All Manufacturers’ Guarantees.

4. Operation and Maintenance Manuals.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS - FIRE DAMPERS

A. Greenheck.

B. Ruskin.

C. Pottorff.

D. Substitutions: Under provisions of Division 01.

2.2 FIRE DAMPERS

A. Fabricate in accordance with NFPA 90A and UL 555 and shall be static type.

B. Fire Resistance: 1-1/2 hour rated.

C. Configuration: Out of wall installation, horizontal mounting. Galvanized finish.

D. Fabricate curtain type dampers of galvanized steel with interlocking blades. Provide stainless steel closure springs and latches for horizontal installations. Damper shall be provided with factory retraining angles sized to provide installation overlap in accordance with UL Listings.

E. Fusible links, UL 33, shall separate at 212 degrees F.

2.3 CONTROL DAMPERS – ACCEPTABLE MANUFACTURERS

A. Manufacturers:

1. Greenheck.
2. Ruskin.
3. Tamco.
4. Substitutions: Division 01 – Product Requirements.

2.4 CONTROL DAMPERS

A. Multi-blade, opposed blade action, control dampers of extruded aluminum, with airfoil type blades of maximum six inch width, blades positioned across short air opening dimension, field replaceable extruded vinyl sealed edges, linked together in rattle-free manner, non-corrosive

molded synthetic bearings, square or hexagonal axles for positive locking connection to blades and linkage, with documented leakage rate not to exceed 6 CFM/sq. ft. at 4" W.G.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Division 01 - Administrative Requirements: Coordination and project conditions.

B. Verify rated walls are ready for fire damper installation.

C. Verify ducts and equipment installations are ready for accessories.

D. Check location of air outlets and inlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement.

3.2 INSTALLATION

A. Install in accordance with NFPA 90A, and follow SMACNA HVAC Duct Construction Standards - Metal and Flexible. Refer to Section 23 31 00 for duct construction and pressure class.

B. Install back-draft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated.

C. Access Doors: Install access doors at the following locations and as indicated:

1. Before and after each duct mounted fan.
2. Before and after each fire damper.

D. Access Door Sizes: Install minimum 8 x 8 inch size for hand access. Review locations prior to fabrication.

E. Install fire dampers at locations as indicated on Drawings. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.

1. Install fire dampers in accordance with NFPA 92A.
2. Install dampers square and free from racking with blades running horizontally.
3. Do not compress or stretch damper frame into duct or opening.
4. Handle damper using sleeve or frame. Do not lift damper using blades, actuator, or jack shaft.
5. Install bracing for multiple section assemblies to support assembly weight and to hold against system pressure. Install bracing as needed.

3.3 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. Operate dampers to verify full range of movement.
2. Inspect locations of access doors and verify that purpose of access door can be performed.
3. Operate fire dampers to verify full range of movement and verify that proper heat-response device is installed.

3.4 DEMONSTRATION

A. Division 01 - Execution and Closeout Requirements: Requirements for demonstration and training.

B. Demonstrate re-setting of fire dampers to Owner's representative.

END OF SECTION 23 33 00

SECTION 23 34 00 - HVAC FANS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Centrifugal Inline fans.

B. Related Sections:

1. Section 23 05 00 - Common Work Results for HVAC.
2. Section 23 05 93 - Testing, Adjusting and Balancing.
3. Section 23 07 00 - HVAC Insulation.
4. Section 23 09 23 - Direct-Digital Control System for HVAC.
5. Section 23 09 93 - Sequence of Operations for HVAC Controls.
6. Section 23 31 00 - HVAC Ducts and Casings.
7. Section 23 33 00 - Air Duct Accessories.
8. Division 26 - Equipment Wiring Connections: Execution and product requirements for connecting equipment specified by this section.

1.2 REFERENCES

A. American Bearing Manufacturers Association:

1. ABMA 9 - Load Ratings and Fatigue Life for Ball Bearings.
2. ABMA 11 - Load Ratings and Fatigue Life for Roller Bearings.

B. Air Movement and Control Association International, Inc.:

1. AMCA 99 - Standards Handbook.
2. AMCA 204 - Balance Quality and Vibration Levels for Fans.
3. AMCA 210 - Laboratory Methods of Testing Fans for Aerodynamic Performance Rating.
4. AMCA 300 - Reverberant Room Method for Sound Testing of Fans.
5. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data.

C. National Electrical Manufacturers Association:

1. NEMA MG 1 - Motors and Generators.
2. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

D. Underwriters Laboratories Inc.:

1. UL 705 - Power Ventilators.

1.3 SUBMITTALS

A. Submit product data under provisions of Division 01.

B. Product Data: Submit data on each type of fan and include accessories, fan curves with specified operating point plotted, power, RPM, sound power levels for both fan inlet and outlet at rated capacity, electrical characteristics and connection requirements.

C. Manufacturer's Installation Instructions: Submit fan manufacturer’s instructions.

D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Submit instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.

1.5 QUALITY ASSURANCE

A. Performance Ratings: Conform to AMCA 210.

B. Sound Ratings: AMCA 301, tested to AMCA 300.

C. UL Compliance: UL listed and labeled, designed, manufactured, and tested in accordance with UL 705.

D. Balance Quality: Conform to AMCA 204.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

B. Installer: Company specializing in performing Work of this section with minimum three years experience.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Division 01 in factory-fabricated protective containers, with factory-installed shipping skids and lifting lugs.

B. Protect motors, shafts, and bearings from weather and construction dust.

C. Protect motors, shafts, and bearings from weather and construction dust.

1.8 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.9 WARRANTY

A. Provide warranty under provisions of Division 01: Product warranties and product bonds.

B. Furnish three year manufacturer's warranty for fans.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Fantech.

B. Greenheck Corp.

C. Loren Cook Company.

D. Twin City.

E. Substitutions: Under provisions of Division 01.

2.2 GENERAL

A. Fans used shall not decrease motor size, increase noise level, or increase tip speed by more than 10 percent, or increase inlet air velocity by more than 20 percent, from specified criteria. Fans shall be capable of accommodating static pressure variations of plus or minus 10 percent.

B. Base performance on sea level conditions unless otherwise noted.

C. Statically and dynamically balance fans to eliminate vibration or noise transmission to occupied areas.

2.3 CENTRIFUGAL INLINE FANS

A. Hub and Impeller:

1. Housing: Galvanized construction with two halves joined with folding seam technique. Statically and dynamically balanced.
2. Backward curved impeller blades.
3. Bearings: Permanently sealed, self-lubricated.
4. Warranty: 5-year factory warranty standard.
5. Options: Provide with optional fan speed controller.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install safety screen where inlet or outlet is exposed.

3.2 MANUFACTURER'S FIELD SERVICES

A. Division 01 - Quality Requirements: Requirements for manufacturer’s field services.

3.3 DEMONSTRATION

A. Demonstrate fan operation and maintenance procedures.

3.4 PROTECTION OF FINISHED WORK

A. Do not operate fans until ductwork is clean, bearings lubricated, and fan has been test run under observation.

END OF SECTION 23 34 00

SECTION 26 05 00 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. General Requirements specifically applicable to Division 26, in addition to Division 01 provisions.

B. The electrical system equipment and installation shall comply with all provisions and requirements of this specification, as well as any and all applicable national, state and local codes and standards.

1.2 WORK SEQUENCE

A. Construct Work in sequence under provisions of Division 01.

1.3 COORDINATION

A. Coordinate the Work specified in this Division under provisions of Division 01.

B. Prepare drawings showing proposed rearrangement of Work to meet job conditions, including changes to Work specified under other Sections. Obtain permission of Architect prior to proceeding.

1.4 REFERENCES

A. ANSI/NFPA 70 - National Electrical Code, latest adopted edition including all state and local amendments.

B. NECA - Standard of Installation.

C. NETA ATS – Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

D. Electrical Reference Symbols: The Electrical "Legend" on drawings is standardized version for this project. All symbols shown may not be used on drawings. Use legend as reference for symbols used on plans.

E. Electrical Drawings: Drawings are diagrammatic; complimentary to the Architectural drawings; not intended to show all features of work. Install material not dimensioned on drawings in a manner to provide a symmetrical appearance. Do not scale drawings for exact

equipment locations. Review Architectural, Structural, and Mechanical Drawings and adjust work to conform to conditions shown thereon. Field verification of dimensions, locations and levels is directed.

1.5 REGULATORY REQUIREMENTS

A. Conform to ANSI/NFPA 70.

B. Conform to the latest adopted edition of the International Building Code and the International Fire Code including all state and local amendments thereto.

C. Obtain electrical permits, plan review, and inspections from authority having jurisdiction.

1.6 SUBMITTALS

A. Submittal review is for general design and arrangement only and does not relieve the Contractor from any requirements of Contract Documents. Submittal not checked for quantity, dimension, fit or proper operation. Where deviations of substitute product or system performance have not been specifically noted in the submittal by the Contractor, provisions of a complete and satisfactory working installation is the sole responsibility of the Contractor.

B. In addition to requirements referenced in Division 01, the following is required for work provided under this division of the specification.

1. Provide material and equipment submittals containing complete listings of material and equipment shown on Electrical Drawings and specified herein. Separate from work furnished under other divisions.
2. Submittals shall be provided in PDF format with each section indexed in the PDF document. Submittals for Division 26 shall be complete and submitted at one time. Unless given prior approval, partial submittals will be returned unreviewed.
3. Clearly identify all material and equipment by item, name or designation used on drawings and in specifications.
4. Submit only pages which are pertinent; mark catalog sheets to identify pertinent products, referenced to Specification Section and Article number. Show reference standards, performance characteristics, and capacities; wiring diagrams and controls; component parts; finishes; dimensions; and required clearances.
5. Modify manufacturer's standard schematic drawings and diagrams to supplement standard information and to provide information specifically applicable to the work. Delete information not applicable.
6. Review submittals prior to transmittal; determine and verify field measurements, field construction criteria, manufacturer's catalog numbers, and conformance of submittal with requirements of Contract Documents.
7. Coordinate submittals with requirements of work and of Contract Documents.

8. Certify in writing that the submitted shop drawings and product data are in compliance with requirements of Contract Documents. Notify Architect/Engineer in writing at time of submittal, of any deviations from requirements of Contract Documents.
9. Do not fabricate products or begin work which requires submittals until return of submittal with Architect/Engineer acceptance.
10. Equipment scheduled by manufacturer's name and catalog designations, manufacturer's published data and/or specification for that item, in effect on bid date, are considered part of this specification. Approval of other manufacturer's item proposed is contingent upon compliance therewith.

1.7 SUBSTITUTIONS

A. In accordance with the General Conditions and the General Requirements, Substitution and Product Options, all substitute items must fit in the available space, and be of equal or better quality including efficiency performance, size, and weight, and must be compatible with existing equipment.

1.8 PROJECT RECORD DRAWINGS

A. Maintain project record drawings in accordance with Division 01.

B. In addition to the other requirements, mark up a clean set of drawings as the work progresses to show the dimensioned location and routing of all electrical work which will become permanently concealed. Show routing of work in permanently concealed blind spaces within the building. Show complete routing and sizing of any significant revisions to the systems shown.

C. Record drawing field mark-ups shall be maintained on-site and shall be available for examination of the Owner’s Representative at all times.

1.9 OPERATION AND MAINTENANCE MANUALS

A. Provide operation and maintenance manuals for training of Owner's Representative in operation and maintenance of systems and related equipment. In addition to requirements referenced in Division 01, the following is required for work provided under this section of the specifications.

B. Manuals shall be separate from work furnished under other divisions. Prepare a separate chapter for instruction of each class of equipment or system. Index and clearly identify each chapter and provide a table of contents.

C. Unless otherwise noted in Division 01, provide one copy of all material for approval.

D. The following is the suggested outline for operation and maintenance manuals and is presented to indicate the extent of items required in manuals.

1. List chapters of information comprising the text. The following is a typical Table of Contents:

    a. Lighting.
    b. Other chapters as necessary.

2. Provide the following items in sequence for each chapter shown in Table of Contents:

    a. Describe the procedures necessary for personnel to operate the system including start-up, operation, emergency operation and shutdown.

        1) Give complete instructions for energizing equipment and making initial settings and adjustments whenever applicable.

    b. Maintenance Instructions:

        1) Provide instructions and a schedule of preventive maintenance, in tabular form, for all routine cleaning and inspection with recommended lubricants if required for the following:

            a) Lighting fixtures.

        2) Provide instructions for minor repair or adjustments required for preventive maintenance routines, limited to repairs and adjustments which may be performed without special tools or test equipment and which requires no special training or skills.
        3) Provide manufacturers' descriptive literature including approved shop drawings covering devices used in system, together with illustrations, exploded views, etc. Also include special devices provided by the Contractor.
        4) Provide any information of a maintenance nature covering warranty items, etc., which have not been discussed elsewhere.
        5) Include list of all equipment furnished for project, where purchased, technical representative if applicable and a local parts source with a tabulation of descriptive data of all electrical-electronic spare parts and all mechanical spare parts proposed for each type of equipment or system. Properly identify each part by part number and manufacturer.

    c. Inspection Certificate: Include copy of certificate of final inspection and acceptance from the Authority Having Jurisdiction.

1.10 DEMONSTRATION OF ELECTRICAL SYSTEMS

A. During substantial completion inspection:

1. Conduct operating test for approval under provisions of Division 01.

2. Demonstrate installation to operate satisfactorily in accordance with requirements of Contract Documents.
3. Should any portion of installation fail to meet requirements of Contract Documents, repair or replace items failing to meet requirements until items can be demonstrated to comply.
4. Have instruments available for measuring light intensities, voltage and current values, and for demonstration of continuity, grounds, or open circuit conditions.
5. Provide personnel to assist in taking measurements and making tests.

1.11 WARRANTY

A. In addition to the requirements of Division 01, or as specified in other sections. Warrant all materials, installation and workmanship for one (1) year from date of acceptance.

B. Copies of manufacturer product warranties for all equipment shall be included in the operation and installation manuals.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. All Materials and Equipment shall be new.

B. All Materials and Equipment shall be listed by Underwriter's Laboratories or equivalent third party listing agency for the use intended.

C. Materials and Equipment shall be acceptable to the authority having jurisdiction as suitable for the use intended when installed per listing and labeling instructions.

D. No materials or equipment containing asbestos in any form shall be used. Where materials or equipment provided by this Contractor are found to contain asbestos such items shall be removed and replaced with non-asbestos containing materials and equipment at no cost to the Owner.

E. In describing the various items of equipment, in general, each item will be described singularly, even though there may be numerous similar items.

PART 3 - EXECUTION

3.1 WORKMANSHIP

A. Install Work using procedures defined in NECA Standard of Installation and/or the manufacturer's installation instructions.

3.2 TESTS

A. Perform tests in accordance with Section 26 01 26 – Maintenance Testing of Electrical Systems.

B. Notify the Owner’s representative at least 72 hours prior to conducting any tests.

C. Following completion of installation, test system ground in accordance with the requirements of NETA ATS 7.13. and all feeders in accordance with NETA ATS 7.3. Submit logs of values obtained, and nameplate data of instruments used prior to final inspection. Include a copy of all data in the power distribution section of the Operation and Maintenance Manuals.

D. Perform additional tests required under other sections of these specifications.

E. Perform all tests in the presence of the Owner's representative.

F. The Contractor shall provide written notification to the Owner's representative and the State Electrical Inspector thirty days in advance of requests for rough-in and substantial completion inspections.

3.3 PENETRATIONS OF FIRE BARRIERS

A. Related information to this section appears in Division 07, Fire Stopping.

B. All holes or voids created to extend electrical systems through fire rated floors, walls or ceiling shall be sealed with an asbestos-free intumescent fire stopping material capable of expanding 8 to 10 times when exposed to temperatures 250ºF or higher.

C. Materials shall be suitable for the fire stopping of penetrations made by steel, glass, plastic and shall be capable of maintaining an effective barrier against flame, smoke and gases in compliance with the requirements of ASTM E814 and UL 1479.

D. The rating of the fire stops shall be the same as the time-rated floor, wall or ceiling assembly.

E. Install fire stopping materials in accordance with the manufacturer's instructions.

F. Unless protected from possible loading or traffic, install fire stopping materials in floors having void openings of four (4) inches or more to support the same floor load requirements as the surrounding floor.

END OF SECTION 26 05 00

SECTION 26 05 05 - SELECTIVE DEMOLITION FOR ELECTRICAL

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Electrical Demolition.

1.2 RELATED SECTIONS

A. Division 01 - Alteration Project Procedures.

B. Division 02 - Minor Demolition for Remodeling.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Materials and equipment for patching and extending work: As specified in individual Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify field measurements and circuiting arrangements are as shown on Drawings.

B. Verify that abandoned wiring and equipment serve only abandoned facilities.

C. Demolition Drawings are based on a non-destructive walkthrough. Report discrepancies to Architect/Engineer before disturbing existing installation.

D. Beginning of demolition means installer accepts existing conditions.

3.2 PREPARATION

A. Coordinate service outages with Owner.

B. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.

C. Existing Electrical Distribution System: Disable system only to make switchovers and connections. Obtain permission from Owner at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

D. Existing Fire Alarm System: Disable system only to make switchovers and connections. Notify Owner and local fire service at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

3.3 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Demolish and extend existing electrical work under provisions of Division 01, Division 02, and this Division.

B. Remove, relocate, and extend existing installations to accommodate new construction.

C. Remove abandoned wiring to source of supply.

D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.

E. Where abandoned conduit is installed below existing slab not scheduled for demolition, remove the conductors, cut conduit flush with floor, and patch surface.

F. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.

G. Maintain access to existing electrical installations which remain active.

H. Extend existing installations using materials and methods as specified.

I. Where materials or equipment are to be turned over to Owner or reused and installed by the Contractor, it shall be the Contractor’s responsibility to maintain condition of materials and equipment equal to the existing condition of the equipment before the work began. Repair or replace damaged materials or equipment at no additional cost to the Owner.

3.4 EXISTING PANELBOARDS

A. Ring out circuits in existing panel affected by the Work. Where additional circuits are needed, reuse circuits available for reuse. Install new breakers.

B. Tag unused circuits as spare.

C. Where existing circuits are indicated to be reused, use sensing measuring devices to verify circuits feeding Project area or are not in use.

D. Remove existing wire no longer in use from panel to equipment.

E. Provide new updated directories where more than three circuits have been modified or rewired.

3.5 INSTALLATION

A. Install relocated materials and equipment under the provisions of Division 01.

3.6 DISPOSAL

A. Dispose of all hazardous waste in accordance with all local, State and Federal requirements.

END OF SECTION 26 05 05

SECTION 26 05 19 – LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Building Wire.

B. Cable.

C. Wiring Connections and Terminations.

1.2 RELATED SECTIONS

A. Section 26 01 26 – Maintenance Testing of Electrical Systems.

B. Section 26 05 53 – Identification for Electrical Systems.

1.3 REFERENCES

A. Federal Specification FS-A-A59544 – Cable and Wire, Electrical (Power, Fixed Installation).

B. Federal Specification FS-J-C-30B – Cable Assembly, Power, Electrical.

C. ANSI/NEMA WC 70-2009 – Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy.

D. NETA ATS – Acceptance testing specifications for Electrical Power Distribution and Systems.

E. NFPA 70 – National Electrical Code.

F. NFPA 262 – Standard Method of test for flame travel and smoke of wires and cables for use in air-handling spaces.

G. UL 83 – Thermoplastic Insulated Wire and Cable.

H. UL 1063 – Standard for Machine and Tool Wire and Cable.

I. UL 1424 – Standard for Cables for Power-Limited Fire Alarm.

J. UL 1479 – Standard for Fire Tests of Through Wall Penetration Fire Stops.

K. UL 1569 – Standard for Metal Clad Cable.

L. UL 1581 – Reference Standard for Electrical Wires, Cables and Flexible Cords.

1.4 SUBMITTALS

A. Submit data under provisions of Division 01 and Section 26 05 00.

B. Product Data: Submit product data for all components provided which fall under this section showing configurations, finishes, and dimensions. Each catalog sheet should be clearly marked to indicate exact part number provided, including all options and accessories.

1.5 QUALITY ASSURANCE

A. Provide wiring materials located in plenums with peak optical density not greater than 0.5, average optical density not greater than 0.15, and flame spread not greater than 5 feet (1.5m) when tested in accordance with NFPA 262.

PART 2 - PRODUCTS

2.1 BUILDING WIRE

A. Thermoplastic-insulated Building Wire: NEMA WC 70.

B. Branch Circuits Larger Than 6 AWG: Copper, stranded conductor, 600 volt insulation, THW, THHN/THWN or XHHW-2 as indicated.

C. Branch Circuits 6 AWG and Smaller: Copper conductor, 600 volt insulation, THHN/THWN or XHHW-2. 6 and 8 AWG, stranded conductor; smaller than 8 AWG, solid or stranded conductor.

D. Branch Circuit Wire Color Code:

1. Color code wires by line or phase as follows:

    a. Black, red, blue and white for 120/208V systems.
    b. Brown, orange, yellow and gray for 277/480V systems.

2. For conductors 6 AWG and smaller, insulation shall be colored. For conductors 4 AWG and larger, identify with colored phase tape at all terminals, splices, and boxes.
3. Grounding conductors 6 AWG and smaller shall have green colored insulation. For 4 AWG and larger, use green tape at both ends and at all other visible points in between, including pull and junction boxes.

E. Control Circuits: Copper, stranded conductor 600 volt insulation, THHN/THNN or XHHW-2.

F. Fire Alarm Notification Appliance Circuits: Copper, solid or stranded conductor 600 volt insulation, THHN/THNN or XHHW-2.

2.2 METAL CLAD CABLE

A. UL 83, 1063, 1479, 1569, and 1581 listed, meets Federal Specification A-A-59544 (formerly J-C-30B). UL rated for installation in cable trays and environmental air handling spaces. Fire wall rated for 1, 2, and 3-hour through penetrations.

B. Type MC Cable, Size 12 Through 10 AWG: Solid copper conductor, 600 volt thermoplastic insulation, rated 90º C dry, 75º wet, insulated green grounding conductor, and galvanized steel or aluminum armor over mylar.

C. Type MC Cable, Size 8 Through 1 AWG: Stranded copper conductor, 600 volt thermoplastic insulation, rated 90º C dry, 75º wet, insulated green grounding conductor, and galvanized steel or aluminum armor over mylar.

D. Fire Alarm/Control Type MC Cable, Size 18 through 12 AWG: Complying with UL 66, 83, 1424, 1479, 1569, 1581, and NFPA 262 (formerly UL 910), solid copper conductor, 300 volt thermoplastic insulation, rated 105º C, insulated green grounding conductor, and red-striped galvanized steel armor over mylar. Conductor insulation shall be color-coded in accordance with Section 28 31 00.

E. All metal clad cable shall be provided with color-coded insulation on all ungrounded conductors in accordance with NEC 210.5(C) and Part 3 of this section.

2.3 REMOTE CONTROL AND SIGNAL CABLE

A. Control Cable for Class 1 Remote Control and Signal Circuits: Copper conductor, 600 volt insulation, rated 90º C, individual conductors twisted together, shielded, and covered with an overall PVC jacket; UL listed.

B. Control Cable for Class 2 or Class 3 Remote Control and Signal Circuits: Copper conductor, 300 volt insulation, rated 90º C, individual conductors twisted together, shielded or unshielded (as required), and covered with a PVC jacket; UL listed.

C. Plenum Cable for Class 2 or Class 3 Remote Control and Signal Circuits: Copper conductor, 300 volt insulation, rated 90º C, individual conductors twisted together, shielded or unshielded (as required), and covered with a nonmetallic jacket; UL listed for use in air handling ducts, hollow spaces used as ducts, and plenums.

2.4 WIRING CONNECTIONS AND TERMINATIONS

A. For conductors 8 AWG and smaller:

1. Dry interior areas: Spring wire connectors, pre-insulated "twist-on" rated 105 degrees C per UL 468C. Where stranded conductors are terminated on screw type terminals, install crimp insulated fork or ring terminals. Thomas & Betts Sta-Kon or equal.
2. Motor connections: Spring wire connectors, pre-insulated "twist-on" rated 105 degrees C per UL 468C. Provide a minimum of 8 wraps of Scotch 33+ electrical tape around conductors and connector to eliminate connector back off.

B. For conductors 6 AWG and larger:

1. Bus lugs and bolted connections: 600 V, 90 degrees C., two hole long barrel irreversible compression copper tin plated. Thomas & Betts or approved equal.
2. Motor connection: 600 V, 90 degrees C., copper tin plated compression motor pigtail connector, quick connect/disconnect, slip on insulator. Thomas & Betts or approved equal.
3. Two way connector for splices or taps: 600 V, 90 degrees C., compression long barrel, copper tin plated. Thomas & Betts or approved equal. Insulate with Scotch 23 rubber insulating base covering and Scotch 33+ outer wrap.

PART 3 - EXECUTION

3.1 GENERAL WIRING METHODS

A. Use no wire smaller than 12 AWG for power and lighting circuits, and no smaller than 18 AWG for control wiring.

B. Use 10 AWG conductor for 20 ampere, 120 volt branch circuit home runs longer than 75 feet, and for 20 ampere, 277 volt branch circuit home runs longer than 200 feet.

C. Splice only in junction or outlet boxes.

D. Neatly train and lace wiring inside boxes, equipment, and panelboards.

E. Make Conductor lengths for parallel circuits equal.

F. Wiring in lighting fixture channels shall be rated for 90º C minimum.

G. Do not share neutral conductors. Provide a dedicated neutral conductor for each branch circuit that requires a neutral.

3.2 WIRING INSTALLATION IN RACEWAYS

A. Pull all conductors into a raceway at the same time. Verify that raceway is complete and properly supported prior to pulling conductors. Use UL listed wire pulling lubricant for pulling 4 AWG and larger wires.

B. Install wire in raceway after interior of building has been physically protected from the weather and all mechanical work likely to injure conductors has been completed.

C. Do not install XHHW-2 conductors when ambient temperatures are below –5 degrees C and THHN/THWN conductors when ambient temperatures are below 0 degrees C.

D. Conductors shall be carefully inspected for insulation defects and protected from damage as they are installed in the raceway. Where the insulation is defective or damaged, the cable section shall be repaired or replaced at the discretion of the Owner and at no additional cost to the Owner.

E. Place an equal number of conductors for each phase of a circuit in same raceway or cable.

F. Route conductors from each system in independent raceway system and not intermix in the same raceway, enclosure, junction box, wireway, or gutter as another system unless otherwise shown on the plans.

G. No more than six current carrying conductors shall be installed in any homerun unless otherwise indicated on the drawings or without prior approval from the Engineer.

H. Completely and thoroughly swab raceway system before installing conductors.

I. When two or more neutrals are installed in one conduit, identify each with the proper circuit number in accordance with Section 26 05 53.

3.3 CABLE INSTALLATION

A. Provide protection for exposed cables where subject to damage.

B. Support cables above accessible ceilings; do not rest on ceiling tiles. Use spring metal clips or cable ties to support cables from structure. Include bridle rings or drive rings.

C. Use suitable cable fittings and connectors.

3.4 WIRING CONNECTIONS AND TERMINATIONS

A. Stranded wire shall not be wrapped around screw terminals.

B. Splice only in accessible junction boxes.

C. Thoroughly clean wires before installing lugs and connectors.

D. Make splices, taps and terminations to carry full ampacity of conductors without perceptible temperature rise.

E. Terminate spare conductors with twist on connectors or heat shrink insulation to proper voltage rating.

F. Control systems wiring in conjunction with mechanical, electrical or miscellaneous equipment to be identified in accordance with wiring diagrams furnished with equipment.

G. Code signal systems wiring and any special equipment in accordance with manufacturer's diagrams or recommendations.

H. Do not exceed manufacturer's recommended pull tensions.

3.5 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Division 01 and Section 26 01 26.

B. Inspect wire and cable for physical damage and proper connection.

C. Torque conductor connections and terminations to manufacturer's recommended values.

3.6 WIRE AND CABLE INSTALLATION SCHEDULE

A. All Locations: Building wire and/or remote control and signal cable in raceways.

B. At the Contractor’s option, Metal Clad cable may be used for branch circuit wiring other than homeruns. Homeruns shall be building wire in raceway. Metal Clad cable used for branch circuit wiring from a light switch to the light fixture shall include a neutral conductor.

C. At the Contractor’s option, portions of the fire alarm wiring in dry, concealed locations may be installed in Fire Alarm Metal Clad cable.

END OF SECTION 26 05 19

SECTION 26 05 26 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Electrical Equipment and Raceway Grounding and Bonding.

1.2 RELATED SECTIONS

A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements, Section 26 05 00 – Common Work Results for Electrical and Division 28.

B. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables.

1.3 REFERENCE STANDARDS

A. ANSI/NFPA 70 – National Electrical Code.

B. ASTM B 3 – Standard Specification for Soft or Annealed Copper Wire.

C. IEEE Std 142 – Recommended Practice for Grounding of Industrial and Commercial Power System.

D. UL 467 – Standard for Grounding and Bonding Equipment.

1.4 SYSTEM DESCRIPTION

A. Provide a complete grounding system for services and equipment as required by State and Local Codes, NEC, applicable portions of other NFPA codes, and as indicated herein.

1.5 SUBMITTALS

A. Product Data: Submit product data for all components provided, showing material type and dimensions. Each catalog sheet should be clearly marked to indicate exact part number provided, including all options and accessories.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Bonding Conductors: Solid bare copper wire for sizes No. 8 AWG and smaller diameter. Stranded bare copper wire for sizes No. 6 AWG and larger diameter. Conductors may be insulated conductors if used provide green insulation.

B. Grounding Conductors: Copper conductor bare or green insulated.

C. Mechanical Grounding and Bonding Connectors: Non-reversible crimp type lugs only. Use factory made compression lug for all terminations.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Provide a separate, insulated equipment-grounding conductor in all new branch circuits. Terminate each end on a grounding lug, bus, or bushing. Multiple conductors on single lug not permitted. Each grounding conductor shall terminate on its own terminal lug.

B. Bond together exposed non-current carrying metal parts of electrical equipment, metal raceway systems, grounding conductor in raceways and cables, and receptacle ground connectors.

C. Grounding conductors for branch circuits shall be sized in accordance with NEC, except minimum size grounding conductor shall be No. 12 AWG.

D. Grounding conductor is in addition to neutral conductor and in no case shall neutral conductor serve as grounding means.

3.2 FIELD QUALITY CONTROL

A. Continuity Test: Continuity test shall be performed on all power receptacles to ensure that the ground terminals are properly grounded to the facility ground system.

END OF SECTION 26 05 26

SECTION 26 05 29 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Section included hangers and supports for Power Systems.

B. Conduit Supports.

C. Formed Steel Channel.

D. Spring Steel Clips.

E. Sleeves.

F. Mechanical Sleeve Seals.

G. Equipment Bases and Supports.

1.2 RELATED SECTIONS

A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements, and Section 26 05 00 – Common Work Results for Electrical and Division 28.

1.3 REFERENCES

A. International Building Code (IBC), Chapter 16 – Structural Design.

1.4 SUBMITTALS

A. Division 01: Requirements for submittals.

B. Product Data: Submit product data for specialty supports.

1.5 QUALITY ASSURANCE

A. Support systems shall be adequate for weight of equipment and conduit, including wiring, which they carry.

PART 2 - PRODUCTS

2.1 CONDUIT SUPPORTS

A. Manufacturers:

1. Allied Tube & Conduit Corp.
2. Minerallac Fastening Systems.
3. O-Z Gedney Co.
4. Substitutions: per Division 01

B. Hanger Rods: Threaded high tensile strength galvanized carbon steel with free running threads.

C. Beam Clamps: Malleable Iron, with tapered hole in base and back to accept either bolt or hanger rod. Set screw: hardened steel.

D. Conduit clamps for trapeze hangers: Galvanized steel, notched to fit trapeze with single bolt to tighten.

E. Conduit clamps - general purpose: One-hole malleable iron for surface mounted conduits.

F. Cable Ties: High strength nylon temperature rated to 185 degrees F. self-locking.

2.2 FORMED STEEL CHANNEL

A. Manufacturers:

1. B-Line Systems.
2. Allied Tube & Conduit Corp.
3. Unistrut Corp.
4. Substitutions: per Division 01.

B. Product Description: Galvanized 12 gage thick steel. With holes 1-1/2 inches on center.

2.3 SLEEVES

A. Sleeves Through Non-fire Rated Floors: 18 gage thick galvanized steel.

B. Sleeves Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 18 gage thick galvanized steel.

C. Sleeves Through Fire Rated and Fire Resistive Floors and Walls, and Fire Proofing: Prefabricated fire rated sleeves including seals, UL listed.

D. Fire-stopping Insulation: Glass fiber type, non-combustible.

2.4 MECHANICAL SLEEVE SEALS

A. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Division 01: Verification of existing conditions before starting work.

B. Verify openings are ready to receive sleeves.

3.2 PREPARATION

A. Obtain permission from Owner’s Representative before using powder-actuated anchors.

B. Obtain permission from Owner’s Representative before drilling or cutting structural members.

3.3 INSTALLATION - GENERAL

A. Fasten hanger rods, conduit clamps, and outlet and junction boxes to building structure using precast insert system, expansion anchors, preset inserts, beam clamps, or spring steel clips.

B. Use toggle bolts or hollow wall fasteners in hollow masonry partitions and walls; expansion anchors or preset inserts in solid masonry walls; self-drilling anchors or expansion anchor on concrete surfaces; sheet metal screws in sheet metal studs; and wood screws in wood construction.

C. Do not support raceways or boxes from ceiling suspension wires or suspended ceiling systems. Provide support from building structure independently to allow ceiling removal and replacement without removal of electrical system. If dedicated support wires are used, wires and wire clips must be painted or color-coded.

D. Do not fasten supports to piping, ductwork, mechanical equipment, conduit, or ceiling suspension system.

E. Fabricate supports from structural steel or steel channel, rigidly welded or bolted to present a neat appearance. Use hexagon head bolts with spring lock washers under all nuts.

F. Install surface-mounted cabinets with minimum of four anchors.

G. Bridge studs top and bottom with channels to support flush-mounted cabinets and panelboards in stud walls.

H. Securely fasten fixtures and equipment to building structure in accordance with manufacturer's recommendations and to provide necessary earthquake anchorage.

I. Earthquake Anchorages:

1. Equipment weighing more than 50 pounds shall be adequately anchored to the building structure to resist lateral earthquake forces.
2. Total lateral (earthquake) forces shall be 1.5 times the equipment weight acting laterally in any direction through the equipment center of gravity. Provide adequate backing at structural attachment points to accept the forces involved.

J. Provide one seismic support wire for all fixtures weighing less than 10lbs. two minimum color-coded dedicated seismic support wires for each ceiling mounted light fixture weighing less than 50 pounds. Attach support wires to building structure independent from ceiling system and on opposing corners of the light fixtures to not allow fixture to drop more than 6 inches upon ceiling failure. Secure each end with three tight wraps within 1 inch at each end of the wire. Provide four supports on fixtures >50 lbs.

K. Attach the supporting cables for all pendant fixtures to both the building structure and to the ceiling grid which they pass through.

3.4 INSTALLATION - SLEEVES

A. Conduit penetrations not required to be watertight: Sleeve and fill with silicon foam.

B. Set sleeves in position in forms. Provide reinforcing around sleeves.

C. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.

D. Extend sleeves through floors 1 inch above finished floor level. Caulk sleeves.

E. Where conduit or raceway penetrates floor, ceiling, or wall, close off space between conduit or raceway and adjacent work with fire stopping insulation and caulk. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

END OF SECTION 26 05 29

SECTION 26 05 33 – RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Metal Conduit.

B. Flexible Metal Conduit.

C. Liquidtight Metal Conduit.

D. Electrical Metallic Tubing.

E. Fittings and Conduit Bodies.

F. Wall and Ceiling Outlet Boxes.

G. Pull and Junction Boxes.

1.2 RELATED SECTIONS

A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under Division 01 - General Requirements and Section 26 05 00 – Common Work Results for Electrical.

B. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables.

C. Section 26 05 26 – Grounding and Bonding for Electrical Systems.

D. Section 26 05 29 – Hangers and Supports for Electrical Systems.

E. Section 26 05 53 – Identification for Electrical Systems.

F. Section 26 27 26 – Wiring Devices.

1.3 REFERENCES

A. American National Standards Institute (ANSI):

1. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
2. ANSI C80.3 - Electrical Metallic Tubing, Zinc Coated.

B. American Society for Testing and Materials (ASTM):

1. ASTM A 123 – Specification for Zinc Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars and Strip.

C. National Electrical Manufacturers Association (NEMA):

1. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
2. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
3. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

D. Underwriters Laboratory (UL):

1. UL 6 - Rigid Steel Conduit, Zinc Coated.
2. UL 514B – Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.

E. National Fire Protection Association (NFPA):

1. NFPA 70 - National Electrical Code.

F. International Building Code (IBC):

1. IBC chapters 16 and 17 seismic requirements.

1.4 RACEWAY AND BOX INSTALLATION SCHEDULE

A. Raceway Minimum Size:

1. Provide 1/2 inch minimum, unless otherwise noted. Raceway may be reduced to ½ inch for final connection of raceway up to 6 feet for connection to fixture or device where maximum conduit entry size is ½ inch.

B. In or through CMU walls:

1. Raceway: Provide rigid steel conduit or intermediate metal conduit. EMT conduit may penetrate through CMU walls where the EMT is installed in a sleeve and does not come in direct contact with the CMU.
2. Boxes and Enclosures: Provide concrete tight cast and sheet metal steel metal boxes.

C. Concealed Dry Locations:

1. Raceway: Provide rigid steel conduit, intermediate metal conduit, or electrical metallic tubing.
2. Boxes and Enclosures: Provide sheet-metal boxes.

3. Fittings: Provide galvanized malleable iron and steel.

D. Exposed Dry Locations:

1. Raceway: Provide rigid steel conduit, intermediate metal conduit or EMT.
2. Boxes and Enclosures: Provide sheet-metal boxes with raised steel covers.
3. Fittings: Provide galvanized malleable iron and steel.
4. Surface Raceway and Boxes. Where specifically noted on the Drawings, provide surface raceway and boxes.

E. Equipment Connections: Provide short extensions (three feet maximum) of flexible metal conduit for connections to light fixtures, motors, transformers, vibrating equipment or equipment that requires removal for maintenance or replacement. Use Liquidtight flexible conduit and fittings for motors and equipment in damp or wet locations or subject to spilling of liquids as at pumps, etc.

1.5 DESIGN REQUIREMENTS

A. Raceway Minimum Size:

1. Line Voltage Circuits: Raceway is sized on the drawings for copper conductors with 600-Volt type XHHW insulation, unless otherwise noted. Where a raceway size is not shown on the drawings, it shall be calculated to not exceed the percentage fill specified in the NEC Table 1, Chapter 9 using the conduit dimensions of the NEC Table 4, Chapter 9 and conductor properties of the NEC Table 5, Chapter 9.
2. Fire Alarm and other Low-Voltage Circuits: Where installed in raceways, the raceway size shall be calculated to not exceed the percentage fill specified in the NEC Table 1, Chapter 9, using the conduit dimensions of the NEC Table 4, Chapter 9, and cable diameter provided by the manufacturer.

B. Box Minimum Size: Provide all boxes sized and configured per NEC Article 370 and as specified in this section.

C. Seismic Support: Provide support in accordance with section 26 05 29 – Hangers and Supports for Electrical Systems.

1.6 SUBMITTALS

A. Product Data: Submit data for products to be provided.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

PART 2 - PRODUCTS

2.1 RIGID METAL CONDUIT (RMC)

A. Rigid Steel Conduit: ANSI C80.1, UL 6.

B. Fittings and Conduit Bodies: NEMA FB 1, UL 514B; Galvanized malleable iron with threaded hubs for all conduit entries. Provide threaded connections and couplings only. Set Screw and running thread fittings are not permitted.

C. Provide insulated throat bushings at all conduit terminations.

2.2 INTERMEDIATE METAL CONDUIT (IMC)

A. Product Description: ANSI C80.6, UL 1242; Galvanized Steel Conduit.

B. Fittings and Conduit Bodies: NEMA FB 1, UL 514B; use fittings and conduit bodies specified above for rigid steel conduit.

C. Provide insulated throat bushings at all conduit terminations.

2.3 FLEXIBLE METAL CONDUIT (FMC)

A. Product Description: UL 1, FS WW-C-566; galvanized or zinc-coated flexible steel, full or reduced-wall thickness.

B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; steel or malleable iron with insulated throat bushings. Die cast zinc or threaded inside throat fittings are not acceptable.

2.4 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

A. Product Description: UL 360, flexible metal conduit with interlocked steel construction and PVC jacket.

B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; liquid tight steel or malleable iron with insulated throat bushings. Die cast fittings are not acceptable.

2.5 ELECTRICAL METALLIC TUBING (EMT)

A. Product Description: ANSI C80.3, UL 797; galvanized steel tubing.

B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; steel or malleable iron, compression type with insulated throat bushings. Zinc die cast, set screw, or indentor fittings are not acceptable.

C. Maximum size shall be 2". Provide factory elbows on sizes 1-½" and larger.

2.6 PULL AND JUNCTION BOXES

A. Sheet Metal Pull and Junction Boxes: ANSI/NEMA OS 1, UL514A galvanized steel.

1. Minimum Size: 4 inches square or octagonal, 1-1/2 inches deep, unless otherwise noted.

2.7 BUSHINGS

A. Non-grounding: Threaded impact resistant plastic.

B. Grounding: Insulated galvanized malleable iron/steel with hardened screw bond to raceway and conductor lug.

2.8 LOCKNUTS

A. Threaded Electro Zinc Plated Steel designed to cut through protective coatings for ground continuity.

2.9 WIREWAY

A. Product Description: General purpose type wireway. Size per NEC minimum fill capacity required.

B. Knockouts: Field-installed, no factory knockouts acceptable.

C. Cover: Screw cover.

D. Fittings and Accessories: Include factory couplings, offsets, elbows, adapters and support straps required for a complete system. Provide internal ground bonding jumper bonded to each section.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Ground and bond raceway and boxes in accordance with Section 26 05 26.

B. Provide seismic support and fasten raceway and box supports to structure and finishes in accordance with Section 26 05 29.

C. Identify raceway and boxes with origin and destination in accordance with Section 26 05 53.

D. Unless otherwise noted, do not inter-mix conductors from separate panelboards or any other system in the same raceway system or junction boxes.

3.2 INSTALLATION - GENERAL RACEWAY

A. Install raceway for all systems, unless otherwise noted.

B. Install an equipment grounding conductor inside of all raceways containing line voltage conductors.

C. Provide raceways concealed in construction unless specifically noted otherwise, or where installed at surface cabinets, motor and equipment connections and in Mechanical and Electrical Equipment rooms. Do not route conduits on roofs, outside of exterior walls, or along the surface of interior finished walls unless specifically noted on the plans.

D. Raceway routing and boxes are shown in approximate locations unless dimensioned. Where raceway routing is not denoted, field-coordinate to provide complete wiring system.

E. Do not route raceways on floor. Arrange raceway and boxes to maintain a minimum of 6 feet 6 inches of headroom and present a neat appearance. Install raceways level and square to a tolerance of 1/8” per 10 feet. Route exposed raceways and raceways above accessible ceilings parallel and perpendicular to walls, ceiling, and adjacent piping.

F. Maintain minimum 6-inch clearance between raceway and mechanical and piping and ductwork. Maintain 12-inch clearance between raceway and heat sources such as flues, steam pipes, heating pipes, heating appliances, and other surfaces with temperatures exceeding 104 degrees F.

G. Seal raceway penetrations of fire-rated walls, ceilings, floors in accordance with the requirements of Section 26 05 00 and Division 07.

H. Where raceway penetrates fire-rated walls and floors, seal opening around conduit with UL listed firestop sealant or intumescent firestop, preserving the fire time rating of the construction. Install in accordance with Section 07 84 00 Firestopping.

I. Arrange raceway supports to prevent misalignment during wiring installation. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.

J. Do not attach raceway to ceiling support wires or other piping systems and do not fasten raceway with wire or perforated pipe straps. Remove all wire used for temporary raceway support during construction, before conductors are pulled. Raceway shall be installed to permit ready removal of equipment, piping, ductwork, or ceiling tiles.

K. Group raceway in parallel runs where practical and use conduit rack constructed of steel channel with conduit straps or clamps, as specified in Section 26 05 29. Provide space on each rack for 25 percent additional raceway.

L. Cut conduit square; de-burr cut ends. Bring conduit to the shoulder of fittings and couplings and fasten securely. Where locknuts are used, install with one inside box and one outside with dished part against box.

M. Use threaded raintight conduit hubs for fastening conduit to cast boxes, and for fastening conduit to sheet metal boxes in damp or wet locations. Sealing locknuts are not acceptable.

N. Install no more than the equivalent of three 90-degree bends between boxes.

O. Install conduit bodies to make sharp changes in direction, such as around beams. "Goosenecks" in conduits are not acceptable.

P. Provide protective plastic bushings or insulated throat bushings at each raceway termination not installed to an enclosure. Bushings shall be threaded to the raceway end or connector.

Q. Avoid moisture traps; install junction box with drain fitting at low points in raceway system.

R. Install fittings and flexible metal conduit to accommodate 3-axis movements where raceway crosses seismic joints.

S. Install fittings designed and listed to accommodate expansion and contraction where raceway crosses control and expansion joints.

T. Use cable sealing fittings forming a watertight non-slip connection to pass cords and cables into conduit. Size cable sealing fitting for the conductor outside diameter. Use Appleton CG series or equal cable sealing fittings.

U. Use suitable caps to protect installed raceway against entrance of moisture.

3.3 INSTALLATION – GENERAL BOXES

A. Provide electrical boxes as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections, and code compliance. All electrical box locations shown on Drawings are approximate unless dimensioned.

B. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only. Where installation is inaccessible, install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaries.

C. Coordinate layout and installation of boxes to provide adequate headroom and working clearance.

D. Align wall-mounted outlet boxes for switches, thermostats, and similar devices.

E. Use multiple-gang boxes where more than one device are mounted together; do not use sectional boxes. Provide barriers to separate wiring of different voltage systems and where normal and emergency power circuits occur in the same box.

F. Verify location of floor boxes in offices and work areas prior to rough-in. Set boxes level and flush with finish flooring material.

G. Adjust box location up to 6 feet prior to rough-in to accommodate intended purpose.

H. Orient boxes to accommodate wiring devices oriented as specified in Section 26 27 26.

I. Unless otherwise specifically noted, locate outlet boxes for light switches within 6 inches of the door jamb on the latch side of the door.

J. Position outlets to locate luminaires as shown on reflected ceiling plans.

K. Locate and install boxes to maintain headroom and to present a neat appearance.

L. Locate flush-mounted box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.

M. Provide knockout closures for unused openings.

N. Install boxes in walls without damaging wall insulation or reducing its effectiveness.

O. Provide recessed outlet boxes in finished areas; secure boxes to interior wall and partition studs, accurately positioning to allow for surface finish thickness. For outlet boxes in walls with combustible finished surfaces such as wood paneling or fabric wall coverings, position box to be flush with finished surface per NEC requirements.

P. Use stamped steel stud bridges for flush outlets in hollow stud wall, and adjustable steel channel fasteners for flush ceiling outlet boxes. Accurately position bridges to allow for surface finish thickness.

Q. Install with minimum 24 inches separation in fire rated walls. Limit penetrations in fire rated walls to 16 square inches each and a maximum total combined penetration area of 100 square inches in any given 100 square feet of wall. Where penetrations are in excess of these requirements provided UL listed fire stop wrap acceptable to Authority having Jurisdiction.

R. Do not fasten boxes to ceiling support wires or other piping systems.

S. Support boxes independently of conduit.

T. Clean interior of boxes to remove dust, debris, and other material and clean exposed surfaces and restore finish.

U. Provide blank covers or plates for all boxes that do not contain devices.

END OF SECTION 26 05 33

SECTION 26 05 53 – IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Nameplates and Tape Labels.

B. Wire and Cable Markers.

C. Wire Markers.

D. Conduit Markers.

1.2 RELATED SECTIONS

A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements, and Section 26 05 00 – Common Work Results for Electrical.

B. Section 26 05 33 – Raceway and Boxes for Electrical Systems.

C. Section 26 24 16 – Panelboards.

D. Section 26 27 26 – Wiring Devices.

1.3 SUBMITTALS

A. Division 01 and Section 26 05 00 – Common Work Results for Electrical.

B. Product Data:

1. Submit manufacturer’s catalog literature for each product required.
2. Submit electrical identification schedule including list of wording, symbols, letter size, color-coding, tag number, location, and function.

1.4 ENVIRONMENTAL REQUIREMENTS

A. Install labels and nameplates only when ambient temperature and humidity conditions for adhesive are within range recommended by manufacturer.

PART 2 - PRODUCTS

2.1 NAMEPLATES

A. Product Description: Laminated three-layer plastic with engraved white letters on black background. Nameplate for service disconnect shall be engraved white letters on red background.

B. Letter Size:

1. 1/4-inch high letters for identifying individual panel or equipment.
2. 1/8-inch high letters for remaining lines with 1/8 inch spacing between lines.

C. Minimum nameplate size: 1/8 inch thick with a consistent length and height for each type of nameplate wherever installed on the project.

2.2 TAPE LABELS

A. Product Description: Adhesive tape labels, with 3/16 inch Bold Black letters on clear background made using Dymo Rhino series label printer or approved equal.

B. Embossed adhesive tape will not be permitted for any application.

2.3 WIRE MARKERS

A. Power and Lighting Description: Machine printed heat-shrink tubing, cloth or wrap-on type, for all neutrals and Phase conductors.

B. Low Voltage System Description: Self-adhesive machine printed label with unique wire number that is shown on shop drawing for system.

2.4 FIRE ALARM CONDUIT AND BOX IDENTIFICATION

A. Product Description: Red spray paint for fire alarm boxes.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION

A. Degrease and clean surfaces to receive nameplates and tape labels.

B. Install nameplates and tape labels parallel to equipment lines.

C. Underground Warning Tape Installation: Install underground warning tape along length of each underground conduit, raceway, or cable 6 to 8 inches below finished grade, directly above buried conduit, raceway, or cable.

3.2 NAMEPLATE INSTALLATION

A. Secure nameplates to equipment fronts using machine screws tapped and threaded into panelboard, or using rivets. The use of adhesives is not acceptable. Machine screws to not protrude more than 1/16 inch on back side.

B. Disconnects:

1. Provide nameplate for each device with the following information:

a. Line 1: Load served.
b. Line 2: Panelboard and circuit number from which the device is fed.
c. Line 3: Fuse or Circuit amperage and poles. Where fused disconnect is installed, denote the maximum fuse size to be installed.

3.3 LABEL INSTALLATION

A. Fire Alarm Device Labels: Match existing type and labeling scheme.

B. Low-Voltage System Device Labels: Provide label on each device, denoting device ID or address where applicable. Affix label to device faceplate for ceiling-mounted devices or wall-mounted devices above 8’-0” AFF. Affix label inside backbox for exterior devices.

3.4 WIRE IDENTIFICATION

A. Provide wire markers on each conductor in panelboard gutters, pull boxes, outlet and junction boxes, and at load connection. Identification shall be as follows:

1. Markers shall be located within one inch of each cable end, except at panelboards, where markers for branch circuit conductors shall be visible without removing panel deadfront.
2. Each wire and cable shall carry the same labeled designation over its entire run, regardless of intermediate terminations.
3. Color code phases, neutral, and ground per NEC requirements and Section 26 05 19.
4. Color-code all low-voltage system wires and cables in accordance with the individual sections in which they are specified.
5. For power and lighting circuits, identify with branch circuit or feeder number.
6. Control Circuits: Control wire number as indicated on schematic and shop drawings.

7. Fire Alarm Circuits: Provide cable markers showing NAC or SLC loop identification number at all fire alarm junction boxes and pullboxes.

3.5 JUNCTION BOX IDENTIFICATION

A. Fire Alarm: In accessible ceiling spaces, exposed ceiling spaces, mechanical/electrical rooms, and other non-public spaces, paint fire alarm junction boxes and pullboxes with red spray paint. In all finished spaces where fire alarm boxes are visible, they shall be painted to match the surrounding finish. If there are any questions as to whether fire alarm boxes shall be painted red in a specific area, the Contractor shall get clarification from the Owner prior to painting.

B. Label each lighting and power junction box with the panelboard name and circuit number.

C. For junction boxes above ceilings, mark the box cover with the circuit or system designation using permanent black marker. For junction boxes in finished areas, mark the inside of the cover with the circuit or system designation using permanent black marker.

3.6 DEVICE PLATE IDENTIFICATION

A. Label each receptacle device plate or point of connection denoting the panelboard name and circuit number.

B. Install adhesive label on the top of each plate.

END OF SECTION 26 05 53

SECTION 26 27 26 - WIRING DEVICES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Receptacles.

B. Device Plates and Box Covers.

1.2 RELATED SECTIONS

A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under Division 01 - General Requirements and Section 26 05 00 – Common Work Results for Electrical.

B. Section 26 05 26 – Grounding and Bonding for Electrical Systems.

C. Section 26 05 33 – Raceway and Boxes for Electrical Systems.

D. Section 26 05 33.16 – Boxes for Electrical Systems.

E. Section 26 05 53 – Identification for Electrical Systems.

1.3 REFERENCE STANDARDS

A. FS W-C-596 – Federal Specification for Electrical Power Connector, Plug, Receptacle, and Cable Outlet.

B. FS W-S-896 – Federal Specification for Switches, Toggle (Toggle and Lock), Flush Mounted.

C. NEMA WD 1 - General Color Requirements for Wiring Devices.

D. ANSI/NEMA WD 6 – Wiring Devices – Dimensional Requirement.

E. UL 20 – General-Use Snap Switches.

F. UL 498 - Attachment Plugs and Receptacles.

G. UL 943 – Ground-Fault-Circuit-Interrupters.

1.4 SUBMITTALS

A. Product Data: Submit product data for all components provided that are specified in this section showing configurations, finishes, and dimensions. Each catalog sheet should be clearly marked to indicate exact part number provided, including all options and accessories.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS - RECEPTACLES

A. Hubbell.

B. Leviton.

C. Pass & Seymour.

D. Arrow Hart

E. Substitutions: Under provisions of Division 01.

2.2 RECEPTACLES

A. Convenience and Straight-blade Receptacles: UL 498, ANSI/NEMA WD-6 and Federal Specification FS W-C-596 industrial grade receptacle.

B. Convenience Receptacle Configuration: ANSI/NEMA WD-6; Type 5-20R, white nylon face.

C. GFCI Receptacles: ANSI/NEMA WD-6; 20A, duplex convenience receptacle with integral class ‘A’ ground fault current interrupter, LED indicator lamp and integral lockout.

2.3 DEVICE PLATES

A. Decorative Cover Plate: Smooth 430 or 302 stainless steel.

B. Exposed Work Cover Plate: ½ inch raised, square, pressed, galvanized or cadmium plated steel cover plate supporting devices independent of the outlet box.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install convenience receptacles 18 inches above floor, 4 inches above counters or backsplash, grounding pole on bottom.

B. Unless otherwise noted, mounting heights are for finished floor to center line of outlet.

C. Install decorative plates on switch, receptacle, and blank outlets in finished areas. Use midsize or jumbo plates for outlets installed in masonry walls, where required to cover up imperfections in the wall opening.

D. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface-mounted outlets.

E. Install devices and wall plates flush and level.

F. Ground receptacles to boxes with a grounding wire. Grounding through the yoke or screw contact is not an acceptable alternate to the ground wire.

END OF SECTION 26 27 26

SECTION 26 28 16 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Enclosed Switches.

B. Fuses.

C. Circuit Breakers

D. Enclosures.

1.2 RELATED SECTIONS

A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements and Section 26 05 00 – Common Work Results for Electrical.

B. Section 26 05 26 – Grounding and Bonding for Electrical Systems.

C. Section 26 05 53 – Identification for Electrical Systems.

1.3 REFERENCE STANDARDS

A. ANSI/UL 198C - High-Intensity Capacity Fuses; Current Limiting Types.

B. ANSI/UL 198E - Class J Fuses.

C. ANSI/UL 98 Enclosed and Dead Front Switches.

D. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).

E. NEMA FU 1 – Low Voltage Cartridge Fuses.

F. UL 489 – Molded Case Circuit Breakers and Circuit Breaker Enclosures.

G. NEMA AB-1 – Molded Case Circuit Breakers and Molded Case Switches.

H. NEMA 250 – Enclosures for Electrical Equipment (1000 Volts Maximum).

I. NETA ATS – Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

1.4 SUBMITTALS

A. Product Data: Submit product data for all components provided, showing electrical characteristics, material, and dimensions. Each catalog sheet should be clearly marked to indicate exact part number provided, including all options and accessories.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Drawings: Accurately indicate actual location of enclosed switches, circuit breakers and ratings of actual installed fuses.

1.6 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.7 EXTRA STOCK

A. Provide extra stock under provisions of Division 01.

B. Fuses: Provide one set of fuses of each size and type of fuse installed.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS - ENCLOSED SWITCHES

A. Square D.

B. Siemens.

C. Cutler Hammer.

D. General Electric.

E. Substitutions: Under provisions of Division 01.

2.2 ENCLOSED SWITCHES

A. Fusible Switch Assemblies: NEMA KS 1; Heavy Duty type; quick-make, quick-break, load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position. Fuse Clips: Designed to accommodate Class J fuses and reject all other classes of fuse.

B. Enclosures: NEMA KS 1; Type 1 or as indicated on Drawings.

2.3 ACCEPTABLE MANUFACTURERS - FUSES

A. Cooper-Bussmann.

B. Ferraz-Shawmut.

C. Economy.

D. Substitutions: Under provisions of Division 01.

2.4 FUSES

A. Fuses 600 Amperes and Less: ANSI/UL 198C, Class J; time delay, one-time fuse, 600 volt.

B. Interrupting Rating: 200,000 rms amperes.

2.5 ACCEPTABLE MANUFACTURERS –CIRCUIT BREAKERS

A. Siemens Energy

B. General Electric.

C. Substitutions: Under provisions of Division 01.

2.6 MOLDED CASE CIRCUIT BREAKERS

A. Molded case circuit breakers shall provide circuit overcurrent protection with inverse time and instantaneous tripping characteristics.

B. All circuit breakers shall have a quick-make, quick break over center toggle type mechanism and the handle mechanism shall be trip free to prevent holding contacts closed against a short circuit or sustained overload. All circuit breaker handles shall assume a position between "ON" and "OFF" when tripped automatically. Multiple pole circuit breakers shall be common trip such that an overload or short circuit on any one pole will result in all poles opening

simultaneously. Arc extinction is to be accomplished by magnetic arc chutes. All ratings are to be clearly visible.

C. Circuit breakers shall have a minimum symmetrical interrupting capacity as indicated on the drawings. The interrupting rating of the circuit breakers shall be at least equal to the available short circuit current at the line terminals of the circuit breaker. Where indicated or allowed, circuit breakers shall be UL listed for series application.

D. Where indicated, circuit breakers shall be current limiting. Current limiting circuit breakers shall limit the let-through I^2t to a value less than the I^2t of one-half cycle wave of the symmetrical prospective current without any fusible elements when operating within its current range.

E. Unless otherwise noted on the drawings, all circuit breakers 250A ampere frame and below shall have thermal-magnetic trip units, with inverse time-current characteristics.

1. Automatic operation of all circuit breakers shall be obtained by means of thermal-magnetic tripping devices located in each pole providing inverse time delay and instantaneous circuit protection. Instantaneous pick-up settings for each phase shall be individually adjustable on all frames 250A and above.
2. Circuit breakers shall be ambient compensating in that, as the ambient temperature increases over 40º C, the circuit breaker automatically derates itself to better protect its associated conductor.

2.7 INTERNAL ACCESSORIES

A. Unless otherwise noted, mechanical lugs shall be provided with all Molded Case Breakers.

B. Compression lugs shall be provided on 1200A frame and below circuit breakers. All compression lugs shall be supplied by the circuit breaker manufacturer.

C. All accessories shall be UL Listed for field installation.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install enclosed switches where indicated on Drawings, and where required for NEC required disconnect of equipment specified under other divisions, but installed under Division 26.

B. Install fuses in fusible disconnect switches.

C. All enclosed switches and enclosed breakers shall have signage for arc hazard installed. The marking shall be located to be clearly visible to qualified personnel before examination,

adjustment, servicing or maintenance of the equipment. At a minimum the signage shall state the following:

Warning

Arc Flash and Shock Hazard

Appropriate PPE Required

3.2 FIELD QUALITY CONTROL

A. Field inspecting, testing, adjusting and balancing.

B. Inspect and test in accordance with NETA ATS, exception Section 4.

C. Perform inspections and tests listed in NETA ATS, Section 7.5.

3.3 ADJUSTMENTS

A. The Contractor shall perform necessary field adjustments of the circuit breakers to place the equipment in final operating condition. The settings shall be in accordance with the approved protective device coordination study or as directed by the Engineer.

END OF SECTION 26 28 16

SECTION 26 50 00 – LIGHTING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Interior and Exterior Luminaires and Accessories.

B. Lamp Modules.

C. Drivers.

1.2 RELATED SECTIONS

A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under General Conditions of the Contract General Requirements, and Section 26 05 00 – Common Work Results for Electrical.

B. Division 09 – Finishes: Painting and Ceilings.

C. Section 26 05 19 – Low Voltage Electrical Power Conductors and Cables.

D. Section 26 05 26 - Grounding and Bonding for Electrical Systems.

E. Section 26 05 29 - Hangers and Supports for Electrical Systems: General Supports for Luminaires.

F. Section 26 05 33 – Raceway and Boxes for Electrical Systems.

G. Section 26 05 53 – Identification for Electrical Systems.

1.3 DEFINITIONS

A. CCT: Correlated Color Temperature.

B. CRI: Color Rendering Index.

C. Driver: LED Power Supply.

D. Fixture: See "Luminaire."

E. IES: Illuminating Engineering Society of North America

F. IP: International Protection or Ingress Protection Rating.

G. Lamp Module: Replaceable LED board array/light engine including a plug-in connector.

H. LED: Light-emitting diode.

I. Lumen: Measured output of lamp and luminaire, or both.

J. Luminaire: Complete lighting unit, including lamp or lamp module, driver, reflector, and housing.

K. THD: Total Harmonic Distortion.

1.4 REFERENCE STANDARDS

A. NECA/IESNA 500 – Recommended Practice for Installation Indoor Commercial Lighting System.

B. IES TM-21-11 Projecting Long Term Lumen Maintenance of LED Light Sources.

C. IES LM-80 IES Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays and Modules.

1.5 SUBMITTALS

A. Product Data: Submit the following:

1. Luminaires: Include manufacturer's product data sheets and/or shop drawings including outline drawings showing support points, weights, and accessory information for each luminaire type. Clearly indicate all options being provided. Arrange data for luminaires in the order of fixture designation.
2. Prior to preparing submittals, coordinate with the reflected ceiling plan for ceiling finishes and provide all necessary kits, brackets, stems, trim, etc. to install the specified fixtures in the ceilings provided. Clearly note these configurations on the product data sheets.

B. Warranty: Provide copies of manufacturer's warranty information for each luminaire. If warranty information is the same for a group of manufacturer's luminaires, provide a letter or schedule clearly indicating what warranty applies to each fixture.

1.6 CLOSEOUT SUBMITTALS

A. Project Record Drawings: Indicate actual locations and mounting heights of all lighting fixtures and accessories on the project record drawings. Update part numbers and description on the Lighting Fixture Schedule to match the actual luminaires installed. Submit under Section 26 05 00.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site, store and protect in a clean, dry environment under provisions of General Conditions of the Contract.

1.8 EXTRA MATERIALS

A. Provide spare parts under provisions of Division 01.

B. Lenses: One of each size and type.

C. Drivers: One of each size and type installed.

D. LED Lamp Modules: Provide a minimum of 1 of each unique type of lamp module used on the project. Ship LED lamp modules (i.e. LED board) in protective packaging and label each lamp module to indicate the fixture type that it may be installed in. (i.e. Type A or Type D1).

E. LED Luminaire: Where the specified or substitute luminaire does not have a replaceable lamp or lamp module, provide one spare luminaire per size and type installed.

PART 2 - PRODUCTS

2.1 INTERIOR AND EXTERIOR LUMINAIRES AND ACCESSORIES

A. Luminaires: Provide UL listed luminaires as scheduled on the drawings or as approved equal.

B. Listing: Luminaires shall be listed for use in the environment in which they are installed. For example, luminaires installed in return air plenums, direct contact with insulation, or in hazardous, wet, damp, or corrosive locations shall be UL listed for such application.

C. Accessories: Provide all mounting kits, supports, interconnecting wiring, power supplies, trim kits, gaskets, etc. for a complete installation.

D. Housing:

1. Metal parts shall be free of burrs and sharp corners and edges. Form and support to prevent warping and sagging.
2. Doors, Frames and Other Internal Access: Smooth operating, free of light leakage under operating conditions. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.
3. Luminaires shall be factory painted and free of discoloration. Color as scheduled.

2.2 LAMP MODULES – LED

A. All LED's shall be nominal 4000 degrees Kelvin (nominal) within a 3-step MacAdam Ellipse unless special circumstances require a different color temperature application, see Luminaire Schedule on Plans.

B. Color Rendering: Minimum CRI as scheduled on the Plans for each fixture. Under no circumstances shall the CRI be less than 70.

C. Lamp Life: Minimum lamp life shall be calculated in accordance with IES LM-80. Lamp life for each luminaire shall be equal or greater than scheduled on the Plans. Under no circumstances shall an interior luminaire have a minimum rated life (L70) less than 50,000 hours at 75 degrees F average indoor ambient temperature.

D. Replaceable: Unless otherwise scheduled, all LED modules shall be field replaceable with quick disconnect connections.

2.3 DRIVERS - LED

A. LED Driver: Provide UL listed power supply as recommended by the LED fixture manufacturer for operation of the specified LED lamps. Power supply shall be integral to the luminaire unless otherwise noted on the Plans. Power supply shall be dual voltage (120/277V) where available or operate at the supply voltage indicated on the Plans.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Coordinate layout and installation of ceiling-mounted devices with other construction items that penetrate ceilings or are supported by them, including luminaires, occupancy sensors, HVAC equipment, and smoke detectors. Adjust locations as required.

B. Unless otherwise noted on Plans, provide drivers integral to luminaires, pre-wired and installed at the factory, suitable for use with the selected LED lamps.

C. Support surface-mounted luminaires directly from building structure. Install level and parallel/perpendicular with ceiling or wall surfaces.

D. Support luminaires in suspended ceilings from structure above in accordance with Section 26 05 29.

E. Provide luminaire disconnecting means in the wiring compartment of each luminaire. Where the luminaire is fed from a multi-wire branch circuit, provide multi-pole disconnect to simultaneously break all supply conductors to the ballast, including the grounded conductor.

F. LED Power Supplies: Install power supplies to be readily accessible. Where power supplies are installed in plenum areas, provide plenum rated listing. Where remote power supplies are used, install in concealed, accessible locations or in utility room that provides adequate sound dampening. Locate driver to allow free air movement in accordance with manufacturer's installation instructions and securely mount to structure.

G. Elevator Shaft Rooms: Lighting fixture locations shown on Plans in elevator pits are approximate. Coordinate mounting height and location of lighting fixtures to clear mechanical, electrical, plumbing and elevator equipment and to adequately illuminate the pit. Support all lighting fixtures independently of duct work or piping.

3.2 RELAMPING

A. Re-lamp or replace luminaires that have failed lamps at completion of work.

3.3 ADJUSTING AND CLEANING

A. Align luminaires and clean lenses and diffusers at completion of work. Clean paint splatters, dirt, and debris from installed luminaires.

B. Touch up luminaire finish at completion of work.

END OF SECTION 26 50 00