222

FORM APPROVED COUNTY COUNSEL 3/12/12 DATE
BY: MARSHA L. VICTOR Departmental Concurrence

By: Steve Thetford, Assistant Sheriff
Sheriff – Coroner - PA

Dep't Recomm.: ☐ Consent ☒ Policy
Per Exec. Ofc.: ☐ Consent ☒ Policy

SUBMITTAL TO THE BOARD OF SUPERVISORS
COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

FROM: Economic Development Agency

SUBMITTAL DATE: March 15, 2012

SUBJECT: Smith Correctional Facility Safety Cells – Approval of Plans and Specifications

RECOMMENDED MOTION: That the Board of Supervisors:

1. Approve the plans and specifications for the construction of the Smith Correctional Facility Safety Cells Project and authorize the Clerk of the Board to advertise for bids; and
2. Delegate project management authority for the project to the Assistant County Executive Officer/EDA in accordance with applicable Board policies.

BACKGROUND: (Commences on Page 2)

REVIEWED BY CIP
Christopher Hans

Robert Field
Assistant County Executive Officer/EDA

FINANCIAL DATA				
	Current F.Y. Total Cost:	$ 0	In Current Year Budget:	Yes
	Current F.Y. Net County Cost:	$ 0	Budget Adjustment:	No
	Annual Net County Cost:	$ 0	For Fiscal Year:	2011/12

COMPANION ITEM ON BOARD OF DIRECTORS AGENDA: No

SOURCE OF FUNDS: Sheriffs Department AB109

Positions To Be Deleted Per A-30 ☐

Requires 4/5 Vote ☐

C.E.O. RECOMMENDATION: APPROVE

County Executive Office Signature BY: Jennifer L. Sargent

MINUTES OF THE BOARD OF SUPERVISORS

On motion of Supervisor Benoit, seconded by Supervisor Tavaglione and duly carried by unanimous vote, IT WAS ORDERED that the above matter is approved as recommended.

Ayes: Buster, Tavaglione, Stone, Benoit and Ashley
Nays: None
Absent: None
Date: March 27, 2012
xc: EDA, Sheriff, CIP, COB

Kecia Harper-Ihem
Clerk of the Board
By: Deputy

Prev. Agn. Ref.: N/A | **District:** 5/5 | **Agenda Number:** 3.17

ATTACHMENTS FILED
WITH THE CLERK OF THE BOARD

BACKGROUND:

On October 6, 2009, the Board of Supervisors approved a pre-qualified list of architectural and engineering firms to be retained on an as-needed basis. The Economic Development Agency (EDA) has selected STK Architecture, Inc. from the pre-qualified list to provide architectural and engineering design services for the expansion of the Smith Correctional Facility Safety Cells project.

With the addition of 582 beds in the Smith Correctional Facility Expansion 3 Project, the facility has an increase need for safety cells.

The bid documents are now complete and EDA requests approval to solicit bids for construction of this project. EDA will return to the Board under separate cover to approve the project budget and execute any related project agreements.

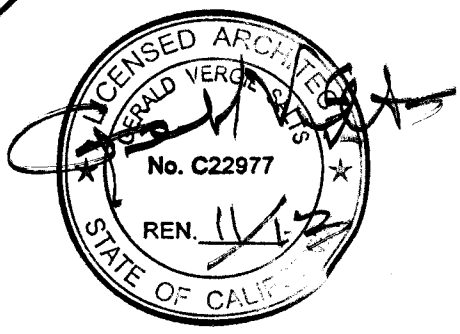
Sufficient funds are budgeted for FY 2011/12. All costs associated with this project will be funded by Sheriffs Department AB109, thus no net county costs will be incurred.

Attachment:

Specifications

SPECIFICATIONS AND CONTRACT DOCUMENTS
FOR

LARRY D. SMITH CORRECTIONAL FACILITY
SAFETY CELL CONVERSION



PREPARED BY
COUNTY OF RIVERSIDE
ECONOMIC DEVELOPMENT AGENCY
PROJECT MANAGEMENT OFFICE
January 15, 2012

FORM APPROVED COUNTY COUNSEL
BY: MARSHALL VICTOR 3/12/12 DATE
MAR 27 2012 3.17

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NOTICE INVITING BIDS

COUNTY OF RIVERSIDE, herein called Owner, invites sealed proposals for :

LARRY D. SMITH CORRECTIONAL FACILITY – SAFETY CELL CONVERSION

This Project consists of the conversion of a holding cell into two (2) safety cells at the Larry D. Smith Correctional Facility.

Proposals shall be delivered to the Clerk of the Board of Supervisors, on the 1st floor of the County Administrative Center located at 4080 Lemon Street, Riverside, CA 92501 no later than **xxxx xx xx Xxxxxxxx, Xxxx xx, 2012** and will be promptly opened in public at said address.

Each Proposal shall be in accordance with the Plans, Specifications, and other Contract Documents and prepared by the Economic Development Agency, County of Riverside. A nonrefundable fee of ($xx.00) will be charged for each set of Plans and Specifications furnished to Contractors. An additional nonrefundable fee will be charged for each set of Plans and Specifications furnished that are requested to be mailed to Contractors. Plans and Specifications may be obtained from Mission Reprographics, 2050 E. La Cadena Drive Suite L Riverside, CA 92507, 951-686-8828.

Pursuant to the Labor Code, the Governing Board of the Owner has obtained from the Director of the Department of Industrial Relations, State of California, his determination of general prevailing rates of per diem wages applicable to the work, and for holiday and overtime work, including employer payments for health and welfare, pension, vacation, and similar purposes, as set forth on the schedule which is on file at the principal office of the Owner, and which will be made available to any interested person upon request.

The Contract General Conditions for this project will contain provisions allowing successful contractor to substitute securities for monies withheld by the County to ensure performance (Public Contract Code 22300).

A Performance Bond and Payment Bond shall be required for this Project.

The Contractor will be required, per Public Contracts Code, Section 3300 and for this contract, to have a State of California contractor's license classification B – General Building Contractor. A **mandatory** pre-bid job walk inspection will be held on **Xxxxx, Xxxxx X, 2012 at 10:00 a.m.**, meeting at **1627 S. Hargrave Street, Banning, CA 92220. We will meet outside of the guard Shack on the parking lot. No bids will be accepted from bidders who have not attended the pre-bid job walk.**

All Request of Information (RFI) should be emailed to both Frank J. Gonzales, EDA Project Manager at fgonzales@rivcoeda.org AND Tony Finaldi of STK Architecture, Inc. at tfinaldi@stkinc.com . RFIs will not be answered via phone calls. Deadline for submission of BID RFI is **Xxxxxx, Xxxxxxxx XX, 2012 at 10:00 am.**

For further information, contact Frank J. Gonzales Project Manager at the Economic Development Agency, Project Management Office at 3403 10th Street Suite 500, Riverside, CA 92501 whose telephone number is (951) 955-8467 and email is fgonzales@rivcoeda.org.

INSTRUCTIONS TO BIDDERS

A. **FORM OF PROPOSAL:** The Proposal must be made on the attached Contractor's Proposal Form which must be filled out completely, dated and signed by the bidder or duly authorized agent in accordance with the directions on the Proposal Form. Each Proposal shall include a complete list of the Subcontractors proposed for every portion of the work, in accordance with Public Contract Code, Section 4100-4114, inclusive.

B. **SUBMISSION OF THE PROPOSAL:** Signed copies of each Proposal shall be sealed in an envelope labeled with Title of Bid and Opening Time. Proposals shall be submitted at the place designated in the Notice Inviting Bids at or before the time specified in said notice. Before that time a proposal may be withdrawn, but only in person by the bidder or someone authorized by him in writing, and not by telephone or telegram.

C. **DRAWINGS AND SPECIFICATIONS:** All drawings, herein enclosed, become a part of the Bid Documents. Additional sets may be provided if requested by bidders and deemed necessary and if there is sufficient time, for the sum of xxxxxx dollars ($xx.xx) per set plus an additional fee per set for mailing if required. Plans and Specifications may be obtained from Mission Reprographics, located at 2050 E.La Cadena Dr. Suite L, Riverside, 951-686-8828, Attn: Mario Silva. All fees are due at the time of request and must be paid by check or money order made payable to "Mission Reprographics".

D. **INTERPRETATION OF THE DOCUMENTS:** Discrepancies in and omissions from the Plans, Specifications or other Contract Documents or questions as to their meaning shall, at once, be brought to the attention of the Owner. Any interpretation of the Documents will be made only by Addenda duly issued and a copy of such Addenda will be mailed or delivered to each person or firm receiving a set of such documents. The Owner will not be responsible for any other explanations or interpretations. Should anything in the scope of the work or any of the sections of the Specifications be of such nature as to be apt to cause disputes between the various trades involved, such information shall be promptly called to the attention of the Owner.

E. **ADDENDA TO THE DOCUMENTS:** The Owner reserves the right to issue such Addenda to the documents as it may desire at any time prior to the time fixed for receiving Proposals. A copy of all such Addenda will be promptly mailed or delivered to each bidder. The number and date of each Addenda shall be listed on the Contractor's Proposal in the space provided.

F. **OWNER'S RESERVATION OF RIGHTS:** The Owner reserves the right to reject any or all Proposals and to waive any informalities in a bid or in the bidding. No bidder may withdraw his bid for a period of sixty (60) days after the time set for the opening thereof.

G. **BIDDER'S CHECK OR BOND:** Each Proposal must be accompanied by a certified or cashier's check or by a bid bond on the form supplied by the Owner, drawn in favor of the Owner in an amount not less than ten percent (10%) of the total Proposal. This check or bond shall be given as a guarantee that the bidder, if awarded the contract, will execute and deliver the Contract Documents and the required Payment and Performance Bonds and proof of insurance in accordance with his Proposal accepted by the Owner. In default of execution of the Contract upon award and/or delivery of said Payment and Performance Bonds, such Proposal bond or check shall be held subject to payment to the Owner of the difference in money between the amount of the bidder's Proposal and the amount for which the Owner may legally contract with another party to perform the said work, together with the costs to the Owner of redrafting, redrawing and publishing documents and papers shall, in addition, be held subject to all other actual damages suffered by the Owner, as set forth on the Contract Documents. Said check or bond will be returned upon the close of the period mentioned in Paragraph F above, and to the successful bidder upon execution of the Contract Documents. **NO BONDS WILL BE ACCEPTED UNLESS SUBMITTED ON THE FORM SUPPLIED BY OWNER.**

H. **AWARD OF CONTRACT:** The Contract shall be awarded upon a Resolution or Minute Order to that effect duly adopted by the Governing Board of the Owner. Execution of the Contract Documents shall constitute a written memorial thereof.

I. **ADDITIONAL INFORMATION:** The Owner reserves the right to require of a bidder, information regarding financial responsibility or such other information as the Owner determines is necessary to ascertain whether a bid is in fact the lowest responsible bid submitted, All references to an Architect shall be deemed to refer to the Owner where no Architect has been employed by the Owner.

J. **PROMPT ACTION BY THE CONTRACTOR:** After the award of the Contract by the Governing Board and within four (4) days after the Agreement Forms are presented to the Contractor for signing, he shall return to the Owner the signed Agreements, along with all necessary Bonds and insurance.

K. **PRE-BID CONFERENCE:** There will be a mandatory pre-bid conference for this project that will be held at the site. No bids will be accepted from bidders who have not attended the pre-bid conference.

L. **BIDS:** Under the bidding items listed on the Contractor's Proposal, bidders shall state prices for each basis for bid given hereinafter.

1. Base Bid shall be the entire work complete in accordance with the contract documents, but not including work indicated or specified to be provided under any of the other bid items.
2. Please note that a separate cost quotation for Contractor's Course of Construction insurance is required per General Conditions Section 2.3.6.

The basis for award will be the qualified bidder with the lowest total of the Base Bid with Course of Construction Insurance and all alternates. Alternates may be awarded in any order after determination of the lowest responsible and responsive bidder.

CONTRACTOR'S PROPOSAL

TO THE GOVERNING BOARD OF THE COUNTY OF RIVERSIDE:

Date: _____

Bidder: _____

The undersigned, having carefully examined the proposed site and the Plans and Specifications, the Notice Inviting Bids, the Instructions to Bidders, the Agreement Form, the Bond Forms, the General Conditions for the Conversion of a Holding Cell in two (2) Safety Cells at the Larry D. Smith Correctional Facility, hereby proposes and agrees to furnish all tools, equipment, services, apparatus, facilities, transportation, labor and materials necessary to complete the work in strict conformity with the Plans and Specifications, including all work specified in Addenda numbered and dated:

Addendum No. _____ Date _____

Addendum No. _____ Date _____

Addendum No. _____ Date _____

Addendum No. _____ Date _____

For the total Base Bid _____ dollars ($_____), including all applicable taxes, permits, licenses, **AND Course of Construction Insurance.**

		(Add or Deduct state which)
Alternate 1	$ _____	_____
Alternate 2	$ _____	_____
Alternate 3	$ _____	_____
Alternate 4	$ _____	_____

And,
Cost of Contractor's Course of Construction Insurance _____dollars ($_____)
and deductible $_____.

Bids must be submitted on all items. Failure to bid on all items may result in the bid being rejected as non-responsive. The basis for award will be the qualified bidder with the lowest total of the Base Bid WITH COURSE OF CONSTRUCTION INSURANCE and all alternates. Alternates may be awarded in any order after determination of the lowest responsible and responsive bidder.

DESIGNATION OF SUBCONTRACTORS

In compliance with Section 4104 of the Public Contract Code the undersigned submits the following complete list of each Subcontractor who will perform work or labor or render service in or about the construction/installation in an amount in excess of 1/2 of 1% of said total bid.

PORTION OF THE WORK	SUBCONTRACTOR	LOCATION

DESIGNATION OF SUBCONTRACTORS (continued)

In compliance with Section 4104 of the Public Contract Code the undersigned submits the following complete list of each Subcontractor who will perform work or labor or render service in or about the construction/installation in an amount in excess of 1/2 of 1% of said total bid.

PORTION OF THE WORK	SUBCONTRACTOR	LOCATION

AWARD OF CONTRACT

The undersigned fully understands that a Contract is formed upon the acceptance of this Proposal by the Owner and the undersigned further agrees that upon request he will promptly execute and deliver to Owner a written memorial of the Contract together with the required Payment and Performance Bonds and proof of insurance.

BID GUARANTEE

The enclosed certified or cashier's check or bidder's bond on approved form, made payable to the Owner in the amount of ten percent of the total bid submitted herewith, is hereby given as a guarantee that the bidder will execute and deliver the above mentioned written memorial and required bonds and insurance if awarded the contract, and in the event that the undersigned fails or refuses to execute and deliver said documents, such check or bond is to be charged with the costs of the damages experienced by the Owner as a result of such failure or refusal, including but not limited to publication costs, the difference in money between the amount of the bid of the said principal and the amount for which obligee may legally contract with another party to perform the said work if such amount be in excess of the former, building lease or rental costs, transportation costs and additional salary costs that result from the delay due to the principal's default on the awarded contract. In no event, however, shall the Surety's liability exceed the penal sum hereof.

Name of Bidder: _____

Type of Organization: _____

Signed By: _____

Title of Signer: _____

Address of Bidder: _____

_____

_____

Affix Seal If Corporation

Telephone No.: _____

Contractor's License No.: _____

Classification: _____ Expiration Date: _____

LICENSURE STATEMENTS ARE MADE UNDER PENALTY OF PERJURY

If bidder is a corporation, and signer is <u>not</u> President or Secretary, attach a certified copy of By-Laws or resolution authorizing execution. If bidder is a corporation, affix corporate seal. If signer is an agent, attach Power of Attorney. If bidder is not an individual, list names of other persons authorized to bind the organization.

NON-COLLUSION DECLARATION TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

(Public Contract Code Section 7106)

The undersigned declares:

I am the _____ of _____, the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder.

All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price of any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____[date], at _____[city], _____[state].

_____
[Signature of Declarant]

_____
[Printed Name of Person Signing]

_____
[Name of Bidder]

_____
[Office or Title]

Bid Bond

KNOWN TO ALL MEN BY THESE PRESENTS, that we, the undersigned _____ _____, as Principal; and _____, as Surety, are hereby held and firmly bound unto the County of Riverside, hereinafter called the "Owner", in the sum of _____ Dollars ($ _____) for the payment of such sum, well and truly to be made, do hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

WHEREAS, the said Principal is herewith submitting its Proposal for the _____ _____ _____ .

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that if the aforesaid Principal shall be awarded the Contract upon said Proposal and shall, within the required number of days after the notice of such award, execute a written memorial of the awarded Contract and submit the required Labor and Material Payment and faithful Performance Bond and proof of insurance, then this obligation shall be null and void; and in the event that the Principal fails and/or refuses to execute and deliver said documents this Bond will be charged with the costs of the damages experienced by the Owner as a result of such refusal, including but not limited to, publication cost, the difference in money between the amount of the bid of the said Principal and the amount for which the obligee may legally contract with another party to perform the said work if such amount be in excess of the former; building lease or rental costs, transportation cost, and additional salary costs that result from the delay due to the Principal's default on the awarded Contract. In no event however, shall the Surety's liability exceed the penal sum hereof.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the Owner may accept such bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the above bounded parties have executed this instrument under their separate seals this _____day of _____, 2012, the name and corporate seal of each corporate party being hereto affixed and those present duly signed by its undersigned representative, pursuant to authority of its governing body.

_____
(Firm Name - Principal)

_____
(Business Address)

Affix Seal If Corporation

By_____
(Original Signature)

_____
(Title)

_____
(Corporation Name - Surety)

_____
(Business Address)

Affix Corporate Seal

By _____
(Original Signature)

AGREEMENT FORM

THIS AGREEMENT, entered into this _____day of _____, 2012, by and between _____, hereinafter called the "Contractor", and the County of Riverside hereinafter called the "Owner".

WITNESSETH: That the parties hereto have mutually covenanted and agreed as follows:

CONTRACT: The Complete Contract includes all of the Contract Documents, to wit: The Notice Inviting Bids, the Instructions to Bidders, the Contractor's Proposal, Wage Schedule, Payment and Performance Bonds, the Plans and Specifications plus any Addenda thereto, the General Conditions, the Supplementary General Conditions, if applicable and this Agreement. All Contract Documents are intended to cooperate and be complimentary so that any work called for in one and not mentioned in the other, or vice versa, is to be executed the same as if mentioned in all Contract Documents.

STATEMENT OF WORK: The Contractor hereby agrees to furnish all tools, equipment, services, apparatus, facilities, transportation, labor and materials for the **Safety Cell Conversion**. In strict accordance with the Plans and Specifications dated June 2011 prepared by STK Architecture, Inc. hereinafter called the "Architect", including Addenda thereto as listed in the Contractor's Proposal, all of which are made a part hereof.

TIME FOR COMPLETION: The work shall be commenced on a date to be specified in a written order of the Architect and shall be completed within ninety (180) calendar days from and after said date. It is expressly agreed that except for extensions of time duly granted in the manner and for the reasons specified in the General Conditions, time shall be of the essence.

COMPENSATION TO BE PAID TO CONTRACTOR: The Owner agrees to pay and the Contractor agrees to accept in full consideration for the performance of the Contract, subject to additions and deductions as provided in the General Conditions, the sum of _____ dollars ($_____) being the total of the base bid plus the following addenda: ___, ___, ____. The sum is to be paid according to the schedule as provided in the General Conditions.

Pursuant to Labor Code, Section 1861, the Contractor gives the following certification: I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for Worker's Compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this Contract.

IN WITNESS WHEREOF, the parties hereto on the day and year first above written have executed this agreement in four (4) counterparts.

Type of Contractor's organization: _____.

If other than individual or corporation, list names of all members who have authority to bind firm.

_____, _____, _____, _____

Firm Name: _____

Address: _____

Contractor's License No.: _____

IF OTHER THAN CORPORATION EXECUTE HERE

Signature: _____

Title: _____

Affix Seal If Corporation

IF CORPORATION, FILL OUT FOLLOWING AND EXECUTE

Name of President of Corporation: _____

Name of Secretary of Corporation: _____

Corporation is organized under the laws of State of _____

Signature: _____

Title: _____

Owner: COUNTY OF RIVERSIDE

Signature: _____

Title: Chairman - Board of Supervisors

Attest: Clerk - Board of Supervisors

By: _____

Title: _____

PAYMENT BOND

(Public Work - Civil Code Section 3247 et seq.)

The makers of this Bond are _____ as Principal and Original Contractor and _____, a corporation, authorized to issue Surety Bonds in California, as Surety, and this Bond is issued in conjunction with that certain public works contract dated _____, 2012 between Principal and County of Riverside, a public entity, as owner, for _____ dollars ($ _____) the total amount payable. THE AMOUNT OF THIS BOND IS 100% OF SAID SUM. Said contract is for public work of: _____

_____

_____.

The beneficiaries of this Bond are as is stated in 3248 of the Civil Code and the requirements and conditions of this Bond are as is set forth in Sections 3248, 3249, 3250 and 3252 of said Code. Without notice, Surety consents to extension of time for performance, change in requirements, amount of compensation, or prepayment under said Contract.

Signed and Sealed this _____Day of +_____2012.

_____
(Firm Name - Principal)

_____
(Business Address)

Affix Seal if Corporation

By: _____
(Signature - Attach Notary's Acknowledgment)

_____
(Title)

_____
(Corporation Name - Surety)

_____
(Business Address)

Affix Corporate Seal

By: _____
(Signature - Attached Notary's Acknowledgment)

ATTORNEY-IN-FACT
(Title-Attach Power of Attorney)

PERFORMANCE BOND

The makers of this Bond, _____, as Principal, and _____ as Surety, are held and firmly bound unto County of Riverside, hereinafter called the Owner, in the sum of _____Dollars ($_____) for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

The condition of this obligation is such, that whereas the Principal entered into a certain contract, hereto attached, with the Owner, dated _____, 2012 for _____ _____.

Now therefore, if the Principal shall well and truly perform and fulfill all the undertakings covenants, terms, conditions and agreements of said Contract during the original term of said Contract and any extension thereof that may be granted by the Owner, with or without notice to the Surety, and during the file of any guarantee required under the Contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modifications of said Contract that may thereafter be made, then this obligation to be void, otherwise to remain in full force and virtue. Without notice, Surety consents to extension of time for performance, change in requirements, change in compensation or prepayment under said Contract.

Signed and Sealed this _____ Day of _____, 2012.

_____
(Firm Name - Principal)

_____
(Business Address)

Affix Seal if Corporation

By: _____
(Signature - Attach Notary's Acknowledgment)

_____
(Title)

_____
(Corporation Name - Surety)

_____
(Business Address)

Affix Corporate Seal

By: _____
(Signature - Attach Notary's Acknowledgment)

ATTORNEY-IN-FACT
(Title-Attach Power of Attorney)

CONTRACTOR'S CERTIFICATE
REGARDING WORKERS' COMPENSATION

Labor Code Section 3700

Every employer, except the State and all political subdivisions or institutions thereof, shall secure the payment of compensation in one or more of the following ways:

(a) By being insured against liability to pay compensation in one or more insurers duly authorized to write compensation insurance in this State.

(b) By securing from the Director of Industrial Relations, a Certificate of Consent to Self-Insure, which may be given upon furnishing proof satisfactory to the Director of Industrial Relations of ability to self-insure and to pay any compensation that may become due to his employees

I am aware of the provisions of Section 3700 of the Labor Code which requires every employer to be insured against liability for Workers' Compensation or to undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of this Contract.

_____
Principal

_____
Principal

_____
Title

(In accordance with Article 5 [commencing at Section 1860], Chapter, Part 7, Division 2 of the Labor Code, the above Certificate must be signed and filed with the Owner prior to performing any work under this Contract.)

GENERAL CONDITIONS
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GENERAL CONDITIONS OF THE CONTRACT

ARTICLE 1 GENERAL PROVISIONS

1.1 DEFINITIONS

THE CONTRACT DOCUMENTS - The Contract Documents consist of the Contract, the Performance Bond and Payment Bond and any other bond required by the Contract, the drawings, the specifications, addenda issued prior to execution of the Contract, and all modifications thereto.

THE CONTRACT - The Contract Documents form the Contract. The Contract represents the entire and integrated agreement between the parties hereto, and supersedes all prior negotiation, representations, or agreements, either written or oral, including the bidding documents.

ACT OF GOD - An Act of God is an earthquake of magnitude 4.5 or greater on the Richter scale, flood, tornado, or other cataclysmic phenomenon of nature, or rain, snowstorm, windstorm, high water, or other natural phenomenon in excess of the normal as established by National Oceanic and Atmospheric Administration weather data.

ACCEPTANCE - Acceptance is when the County determines all of the Contract requirements have been completed. Execution of the Notice of Completion will signify acceptance. A copy of the Notice of Completion will be sent to the Contractor after execution by the County. Upon receipt of the Notice of Completion, the Contractor will be relieved of the duty of protecting the work, and the County will initiate final settlement and payment.

ARCHITECT - The use of the term Architect shall mean the individual, partnership, corporation, association or joint venture contracted by the County for the design of this Work, as designated on the title sheet of these specifications and Contract Documents.

BENEFICIAL OCCUPANCY - The right of the County to occupy all or any portion of the project prior to final Acceptance of the Work. Such occupancy does not constitute acceptance or completion by the Contractor of the Work or any portion thereof, nor will it relieve the Contractor of the responsibility for correcting defective work or materials found at any time before Acceptance of the Work.

COUNTY - The term County when used herein shall mean the Board of Supervisors of the County of Riverside, a political subdivision of the State of California.

CHANGE ORDER - A Change Order is the document issued by the County authorizing any change or adjustment to the Contract Documents in accordance with Article 19 of this Contract.

CONTRACT DRAWINGS - "Contract drawings" or "drawings" means and includes (a) all drawings which have been prepared on behalf of the County and are included in the Contract Documents and all clarification drawings issued by notice to the bidders thereto; (b) all drawings submitted pursuant to the terms of the Contract by the Contractor to the County during the progress of the Work, which are accepted by the County.

CONTRACTOR'S AGENT - The representative of the Contractor, approved by the County, who shall be present at the Work and be authorized to receive and act upon instructions from the County and to execute and direct the Work on behalf of the Contractor.

CONTRACTOR - When used herein, Contractor means the prime or principal Contractor licensed to perform work in the State of California, including all joint ventures. References to subcontractor or others are only for convenience and all such references shall be considered to refer to the Contractor. The prime or principal Contractor shall be responsible for all subcontractors, and all subcontractors shall require their subcontractors to comply with the relevant provisions of the prime or principal contract.

CRITICAL PATH METHOD(CPM) - "Critical Path Method" is a schedule technique.

DAY - The use of "day" herein means calendar day and shall include every day including Saturdays, Sundays, and legal holidays.

DIRECTOR - The use of "Director" shall mean the Assistant County Executive Officer/EDA of the County or his designated representative.

INSTALL - When used herein, "install" shall mean the complete installation, in place, of any item, equipment or material.

MATERIAL - Material shall be construed to include machinery, equipment, manufactured articles, or construction such as form work, fasteners, etc., and any other classes of material to be furnished in connection with the Contract. All materials shall be new.

NOTICE OF COMPLETION - The Notice of Completion ("NOC") shall be issued at that point in the Contract when the Contractor has completed all Work required in the Contract Documents. The time for issuance shall be determined by the County through a final inspection. The NOC shall be issued by the Board of Supervisors.

NOTICE TO PROCEED - The Notice to Proceed is the written notification from the County giving the Contractor notice to commence with the Work. The Notice to Proceed will specify the start date for the Work and the completion date.

REQUEST FOR INFORMATION - (RFI) The form and procedure established for communication between the Contractor and the County to clarify or interpret the Contract Documents.

REQUEST FOR QUOTATION - (RFQ) A document consisting of supplemental details, instruction, or information issued by the Architect, through the County, for the purpose of obtaining price quotations for possible changes in the Work.

SHALL - When used herein, "shall" means anything, which is mandatory to be performed by the Contractor.

SPECIFICATIONS - The term "Specifications" means that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards and workmanship for the Work.

SUBCONTRACTOR - The term "Subcontractor" means a person or firm that has a contract with Contractor or with another subcontractor to perform a portion of the Work. Unless otherwise specifically provided, the term Subcontractor includes Subcontractors of any tier, suppliers, manufacturers, and distributors. The term Subcontractor is referred to throughout the Contract Documents as if singular in number.

WORK - The term "Work" comprises the services and materials required by the Contract Documents, as may be amended, and includes all labor necessary to produce the construction required by the Contract Documents, and all materials and equipment incorporated or to be incorporated in such construction.

1.2 AUTHORITIES AND LIMITATIONS

1.2.1 The Board of Supervisors alone have the power to bind the County and to exercise the rights, responsibilities, authorities, and functions vested therein by the Contract Documents, except that they shall have the right to designate authorized representatives to act for them.

1.2.2 Neither the Contract, nor any part thereof, nor moneys due or to become due there under may be assigned by the Contractor without the prior written approval of the County, with the exception of the assignments to County which may be required under the terms of this Contract.

1.3 LEGAL REQUIREMENTS

1.3.1 Contractor shall keep informed of, and comply with, all federal, state and county laws, ordinances, rules, and regulations applicable to the Work or to those engaged or employed in the Work of this Contract, especially (but not limited to) those laws relating to hours of employment, prevailing wages, payment of wages, sanitary and safety conditions for workers, workers' compensation insurance, type and kind of materials that can be used, non-discrimination in employment and affirmative action programs. Failure to identify a specific provision in these Contract Documents shall not excuse the Contractor from complying with such applicable statutory requirements.

1.3.2 If conflict arises between provisions of the Contract Documents and any such laws, rules, or regulations, the Contractor shall notify the County at once in writing. If, before receiving clarification, Contractor performs any portion of the Work affected by such apparent conflict, such performance shall be at Contractor's own risk. Contractor shall not be entitled to any additional compensation or time by reason of the conflict or its later correction.

1.3.3 All work and materials shall be in full accordance with the latest applicable (or otherwise noted) codes, rules, and regulations including, but not limited to, the following:
.Uniform Building Code
.Uniform Plumbing Code
.Uniform Mechanical Code
.Uniform Fire Code
.State Fire Marshal
.State Industrial Accident Commission's Safety Orders
.Rules of Local Utilities

1.3.4 Nothing in the specifications is to be construed to permit work not conforming to the above, and expense incurred complying with the above shall be borne by the Contractor. Whenever the specifications and working details require higher standards than those required by the ordinances, codes and statutes, the specifications and working details shall take priority over the ordinances, codes and statutes.

1.3.5 In submitting a bid on this public works projects, or any subcontractor agreeing to supply goods, services, or materials, and entering a contract pursuant thereto, the contractor and\or subcontractor do offer and agree to assign the County all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700)

of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the awarding body tenders final acknowledgement by the parties.

1.4 STANDARD REFERENCES

1.4.1 All documents and publications (such as, but not limited to, manuals, handbooks, codes, standards, and specifications) which are cited in this Contract for the purpose of establishing technical (non-administrative) requirements applicable to equipment, materials, or workmanship under this Contract, shall be deemed to be incorporated herein as though fully set forth.

1.4.2 Whenever reference is made to any particular document or publication, the Contractor shall comply with the requirements set out in the edition specified in this Contract, or if not specified, the latest edition or revision thereof, in effect on the date of the solicitation of bid on this project, except as modified by, as otherwise provided in, or as limited to type, class, or grade, in the specifications of this Contract.

1.5 PERMITS, LICENSES, FEES & TAXES

1.5.1 COUNTYS RESPONSIBILITIES

a. The County will apply for all plan checks and will apply for and obtain the Building Permit(s), the Grading Permit and Construction Permits required by the County of Riverside, paying all fees in connection therewith.

b. The County will furnish, at no expense to the Contractor, all on-site inspection of the Work and will arrange and pay for off-site inspection only as noted in the Contract Documents.

1.5.2 CONTRACTOR'S RESPONSIBILITIES

a. The Contractor shall obtain and pay for all other permits and licenses required for the Work, including excavation permit and for plumbing, mechanical and electrical work and for operations in or over public streets or right of way under jurisdiction of public agencies other than the County.

b. Exclusive of off-site inspection specified herein to be the County's responsibility, the Contractor shall arrange and pay for all off-site inspection of the Work, including certification, required by the specifications, drawings, or by governing authorities.

c. Before Acceptance of the project by the County, the Contractor shall submit all licenses, permits, and certificates of inspection to the County.

1.6 SEPARATE CONTRACTS

1.6.1 The County reserves the right to perform work related to this project with its own forces, and to award separate contracts in connection with other portions of the project or other work on the site. The Contractor shall cooperate with others in the prosecution of all work and shall not interfere with material, appliances or workmen of the County or any other contractor engaged by the County at the site of the Work. In case of disagreement regarding such use, the matter shall be referred to the County whose decision relative to said use shall govern.

1.6.2 The Contractor shall afford the County and separate contractors reasonable opportunity for the introduction and

storage of their materials and equipment and the execution of their work, and shall properly connect and coordinate Contractor's Work with theirs.

1.6.3 If any part of the Contractor's Work depends for proper execution or results upon the work of the County or any separate contractor, the Contractor shall inspect and promptly report to the County any discrepancies or defects in such other work that render it unsuitable for such proper execution and results. Failure of the Contractor to so inspect and report shall constitute an acceptance of the County's or the separate contractor's work as fit and proper to receive the Work, except as to defects which may develop in the other separate contractor's work after the execution of the Contractor's Work.

1.6.4 Should the Contractor cause damage to the work or property of any separate contractor on the Project, the Contractor shall, upon due notice, settle with such other contractor by agreement, if both will so settle. If such separate contractor sues the County because of any damage alleged to have been so sustained, the Contractor agrees to indemnify and defend the County in such proceedings with the County retaining the right to select and hire independent counsel for the County paid by the Contractor.

1.6.5 Any cost caused by defective or ill-timed work shall be borne by the party responsible therefore.

1.7 COUNTY'S AUTHORIZED REPRESENTATIVE, INSPECTOR(S), & ARCHITECT

1.7.1 AUTHORIZED REPRESENTATIVE

The County shall designate a representative during the Work, who shall have the right to be present at the job site during construction and shall supervise any additional representatives appointed by the County.

1.7.2 INSPECTOR(S)

The Inspector(s) shall have the right to observe the installation of all materials and equipment to be incorporated into the Work and the placing of such material and equipment to determine in general if the Work is proceeding in accordance with the Contract Documents. The Inspector(s) is not authorized to make changes in the Contract Documents. On the basis of his observations, he shall keep the County informed as to the progress of the Work. The Inspector shall not be responsible for means, methods, techniques, sequences, or procedures of construction nor for safety precautions and programs in connection with the Work. Nor will the inspector be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents.

1.7.3 ARCHITECT

a. The County has retained an Architect for this project. The Architect will advise and consult with the County, and the County will issue instructions to the Contractor. The Architect will be requested to interpret the requirements of the Contract. When requested by the County, the Architect will, within a reasonable time, render such interpretations as he may deem necessary for the proper execution of the Work.

b. The Architect will make periodic visits to the job site to familiarize himself generally with the progress and quality of the Work and to determine in general whether the work is proceeding in accordance with the Contract Documents. Based on such observations he will recommend approval of applications for progress payments made by Contractor. The Architect shall not be responsible for means, methods, techniques, sequences, or procedures of construction nor for safety precautions and programs in connection with the Work. Nor will the Architect be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents.

ARTICLE 2 BONDS AND INSURANCE

2.1 BIDS OF $25,000 OR LESS

2.1.1 If the total amount bid on the Work is $25,000 or less, the payment bond and performance bond are not required, provided that one payment of all compensation shall be made following Acceptance of all work.

2.2 BONDS

2.2.1 GENERAL REQUIREMENTS

a. Before commencing any Work under this Contract, the Contractor shall file four of each bond with the County. These bonds shall be in the amounts and for the purposes specified below. They shall be surety bonds issued by:

(1) Either a California Admitted Surety OR a current Treasury Listed Surety (Federal Register).

And

(2) Either a current A.M. Best A VIII rated Surety OR an admitted surety insurer which complies with the provisions of the Code of Civil Procedure, § 995.660.

b. Should any surety or sureties upon said bonds or any of them become insufficient, Contractor shall renew said bond or bonds with good and sufficient sureties within ten (10) calendar days after receiving notice from the County that the surety or sureties are insufficient. Cost of bonds shall be included in the bid price.

2.2.2 PERFORMANCE BOND

The successful bidder shall deliver to the County an executed Performance Bond on the attached form in an amount equal to 100% of the accepted bid as security for the faithful performance of the Contract.

2.2.3 PAYMENT BOND

The successful bidder shall deliver to the County an executed Payment Bond on the attached form in an amount equal to 100% of the accepted bid as security for the payment of all persons performing labor and furnishing materials in connection with the Work.

2.3 INSURANCE

2.3.1 GENERAL REQUIREMENTS

Before commencing this Work under the Contract, and without limiting or diminishing CONTRACTOR'S obligation to indemnify and hold the COUNTY harmless, the Contractor shall procure and maintain, or cause to be maintained at its sole cost and expense, the following insurance coverages during the term of this Contract.

2.3.2 WORKERS' COMPENSATION INSURANCE

Contractor shall secure Workers' Compensation Insurance (Coverage A) as prescribed by the laws of the State of California. Policy shall include Employers' Liability (Coverage B) including Occupational Disease

with limits not less than $1,000,000 per person per accident. Policy shall be endorsed, if applicable, to provide a Borrowed Servant/Alternate Employer Endorsement, and contain a Waiver of Subrogation in favor of the County of *Riverside* Pursuant to Section 3700 of the Labor Code of the State of California, Contractor shall file with the County before commencing the Work the following signed certification:

> "I am aware of the provisions of Section 3700 of the Labor Code, which requires every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and I shall comply with such provisions before commencing the performance of the Work of this Contract."

2.3.3 COMMERCIAL GENERAL LIABILITY:

Commercial General Liability insurance coverage, including but not limited to, premises liability, contractual liability, products/completed operations if applicable, personal and advertising injury – which may arise from or out of CONTRACTOR'S operations, use, and management of the premises, or the performance of its obligations hereunder. Policy shall name the County of Riverside—it's Director's, Officers, special Districts, Board of Supervisors, employees, agents or representatives as Additional Insured, and contain a Waiver of Subrogation in favor of the County of Riverside. Policy limits shall not be less than $1,000,000 per occurrence combined single limits. If such insurance contains a general aggregate limit, it shall apply separately to this agreement or be no less than two (2) times the occurrence limit. Policy shall also contain coverage for $5,000 Medical Payments coverage per accident, per person, and Fire Legal Liability in an amount not less than $50,000.

2.3.4 VEHICLE LIABILITY:

If CONTRACTOR'S vehicles or licensed mobile equipment are used on County property, or used in any manner on behalf of the County, CONTRACTOR shall maintain auto liability insurance for all owned, non-owned and hired automobiles in an amount not less than $1,000,000 per occurrence combined single limit, $2,000,000 in the aggregate. Policy shall name the County of Riverside, its Director's Officers, Special Districts, Board of Supervisors, employees, agents, or representatives as Additional Insured, and provide a Waiver of Subrogation in favor of the County of Riverside.

2.3.5 PROPERTY (PHYSICAL DAMAGE):

All-Risk property insurance coverage for the full replacement value of all CONTRACTOR'S equipment, improvements/alterations, temporary structures, and systems (Care, Custody, and Control of CONTRACTOR) used on COUNTY property, or used in any way connected with the accomplishment of the Work performed in this contract.

2.3.6 COURSE OF CONSTRUCTION INSURANCE

CONTRACTOR shall provide All Risk Builder's Risk (Course of Construction) insurance, including earthquake and flood if in an earthquake or flood zone (required on financed or bond financing arrangements), covering the COUNTY, the CONTRACTOR and every subcontractor of every tier for the entire project including property to be used in the construction of the project while such property is at off site storage locations or while in transit. Policy shall include coverage for collapse, faulty workmanship, debris removal, expediting expense, Fire Department Service charges, valuable papers and records, trees, grass, shrubbery and plants. If scaffolding, falsework and temporary buildings are insured separately by the CONTRACTOR or others, evidence of such separate coverage shall be provided to COUNTY prior to the start of the work. Policy shall be written on a completed value form. Policy shall also provide coverage for temporary structures (onsite offices,

etc.), fixtures, machinery and equipment being installed as part of the construction project. (The Base Bid including course of construction insurance shall be used for determination of lowest bid, unless otherwise stated in the bid form.)

CONTRACTOR shall provide a bid price with Course of Construction insurance as outlined herein, and shall also separately provide the cost of the Course of Construction insurance and deductible; and shall declare all terms, conditions, coverages and limits upon request of COUNTY. COUNTY RETAINS THE RIGHT TO CHOOSE TO USE ITS OWN COURSE OF CONSTRUCTION PROGRAM. If the COUNTY program is chosen, CONTRACTOR shall assume the cost of any and all applicable policy deductibles (currently $50,000 per occurrence), and shall insure its own machinery, equipment, tools, etc., from any loss of any nature whatever. If COUNTY elects the CONTRACTOR's All Risk Builder's Risk Program, CONTRACTOR shall be responsible for any and all policy deductibles.

2.3.7 GENERAL INSURANCE PROVISION – ALL LINES:

a. Any insurance carrier providing insurance coverage hereunder shall be admitted to the State of California unless waived, in writing, by the County Risk Manager. Carrier(s) shall have an A.M. BEST rating of not less than an A:VIII. Insurance deductibles or self-insured retentions must be declared by the carrier(s), and such deductibles and retentions shall have the prior written consent from the County Risk Manager. At the election of the Risk Manager, carriers shall provide written notification, and shall either 1) reduce or eliminate such deductibles or self-insured retentions, or 2) procure a bond which guarantees payment of losses and related investigations, claims administration, and defense costs and expenses. If no written notice is received from the County Risk Manager within ten (10) days of the acceptance of agreement, then such deductibles or self-insured retentions shall be deemed acceptable.

b. Cause its insurance carrier(s) to furnish the County of Riverside with either 1) a properly executed original Certificates(s) of Insurance and certified original copies of Endorsements effecting coverage as required herein, or 2) if requested to do so in writing by the County Risk Manager, provide original Certified copies of policies including all Endorsements and all attachments thereto, showing such insurance is in full force and effect. The County of Riverside, its Director's and Officers, Special Districts, Board of Supervisors, elected officials, employees, agents or representatives are named as Additional Insureds. Further, said Certificates(s) and policies of insurance shall contain the covenant of the insurance carrier(s) that shall provide no less than thirty (30) days written notice be given to the County of Riverside prior to any material modification or cancellation of such insurance. In the event of a material modification or cancellation of coverage, this Agreement shall terminate forthwith, unless the County of Riverside receives, prior to such effective date, another properly executed original Certificate of Insurance and original copies of endorsements or certified original policies, including all endorsements and attachments thereto evidencing coverages set forth herein and the insurance required herein is in fullforce and effect. **CONTRACTOR shall not take possession, or use the Premises, or commence operations under this Agreement until the County of Riverside has been furnished original Certificate(s) of Insurance and certified original copies of Endorsements or policies of insurance including all Endorsements and any and all other attachments as required in this Section. The original Endorsements for each policy and the Certificate of Insurance shall be signed by an individual authorized by the insurance carrier to do so on its behalf.**

c. It is understood and agreed to by the parties hereto and the insurance company(s), that the Certificate(s) of Insurance and policies shall so covenant and shall be construed as primary, and the COUNTY'S insurance and/or deductibles and/or self-insured retentions or self-insured programs shall not be construed as contributory.

The County of Riverside's Reserved Rights-Insurance. The County of Riverside reserves the right to adjust the monetary limits of insurance coverage's during the term of this agreement or any extension thereof-if in the County Risk Manager's reasonable judgment, the amount or type of insurance carried by the CONTRACTOR becomes inadequate.

d. CONTRACTOR shall pass down the insurance obligations contained herein to all tiers of sub-consultants working under this Agreement.

2.4 INDEMNITY AND HOLD HARMLESS

2.4.1 CONTRACTOR agrees to and shall indemnify and hold the COUNTY-its officers, employees and agents free and harmless from any and all claims, actions, damages and liabilities of whatsoever kind and nature arising from death, personal injury, property damage or other cause asserted or, based upon any negligent act or omission of CONTRACTOR, its employees, agents, invitees, or any subcontractor of CONTRACTOR relating to or in any way connected with the accomplishment of the work or performance of services under this Agreement, regardless of the existence or degree of fault or negligence on the part of the COUNTY or any officer or employee of said COUNTY, other than the sole active negligence or willful misconduct of COUNTY-its Directors and Officers, Special Districts, Board of Supervisors, elected officials, employees, agents or representatives. As part hereto of the foregoing indemnity CONTRACTOR agrees to protect and defend at its own expense, including attorneys' fees the COUNTY-its Directors and Officers, Specials Districts, Board of Supervisors, elected officials, employees, agents or representatives from any and all legal action based upon any acts or omissions, as stated hereinabove, by any person or persons.

2.4.2 If any such claim, action, or proceeding is brought against County or County's officers, agents, employees, or independent contractors, Contractor, upon notice from County, shall defend the same at Contractor's expense by counsel satisfactory to County.

2.4.3 County shall promptly notify Contractor of any claim, action, or proceeding against County or County's officers, agents employees, independent contractors, and consultants relating to the performance, or omission to perform, any term or condition of this Contract. County shall cooperate fully in the defense of such claim, action, or proceeding.

2.4.4 County shall not be liable or responsible for any accident, loss or damage occurring to the Work prior to the completion and Acceptance of same, unless otherwise specifically agreed to at the time of occupancy by the County.

ARTICLE 3 SITE CONDITIONS

3.1 DIFFERING SITE CONDITIONS

3.1.1 The Contractor shall have reviewed and ascertained pertinent local conditions such as location, accessibility, and general character of the site and satisfy himself as to the conditions under which the Work is to be performed. No claim for allowances shall be made because of Contractor's error or negligence in acquainting himself with the conditions at the site.

3.1.2 The Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by County. The Contractor shall promptly report in writing to County any errors, inconsistencies, or omissions in the Contract Documents or inconsistencies with applicable code requirements observed by Contractor.

3.1.3 If Contractor performs any construction activity which it knows or should know involves an error,

inconsistency, or omission without notifying and obtaining the written consent of County, Contractor shall be responsible for the resultant losses, including, without limitation, the costs of correcting defective work.

3.1.4 The County will furnish surveys necessary to properly locate the property and establish the boundaries thereof with general reference points as well as to enable the Contractor to proceed with the Work.

3.1.5 The Contractor shall provide competent engineering services to lay out the Work and all parts thereof and to establish all grades and elevations in accordance with the Contract requirements. He shall verify the figures shown on the survey and approach drawings before undertaking any construction work and shall be responsible for the accuracy of the finished work.

3.1.6 The Contractor shall protect and preserve established bench marks and monuments and shall make no changes in locations without the written approval of the County. Any bench marks or monuments that are lost or destroyed shall be replaced by the Contractor subsequent to notification and approval from County.

3.2 SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK

3.2.1 The Contractor acknowledges by submission of his/her bid that he has satisfied himself 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 any exploratory work deemed necessary by the Contractor. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating the difficulty and cost of successfully performing the Work, or for proceeding to successfully perform the Work without additional expense to the County.

3.3 DIMENSIONS AND MEASUREMENTS

3.3.1 All dimensions shown for existing conditions and all dimensions required for work that is to connect with work now in place, shall be verified and calculated by the Contractor by actual measurement of the existing work. Any discrepancies between the Contract Documents and the existing conditions shall be referred to the authorized representative of the County before any work affected thereby has been performed. Failure to notify the County before starting work will be considered acceptance by the Contractor. Where doubts as to dimensions exist, County shall determine the correct dimensions.

ARTICLE 4 SPECIFICATIONS AND DRAWINGS

4.1 GENERAL PROVISIONS

4.1.1 SUBDIVISIONS

For convenience, the specifications are arranged into several sections, but such separation shall not be considered as the limits of the work required of any separate trade. The terms and conditions of such limitations are wholly between the Contractor and his subcontractors. Requirements contained in any section are required as if contained in all sections and are the responsibility of the Contractor. The Contractor, prior to awarding subcontracts, will assure the Work required as a whole has been coordinated among the subcontracts.

4.1.2 RECORD DOCUMENTS

a. The Contractor shall keep on the Work site a copy of the awarded construction documents (drawings and specifications) and shall at all times give the County and Architect access thereto.

b. The Contractor will be given one set of drawings and specifications which shall be kept at the site of the Work at all times and updated weekly. Payment may be withheld if drawings are not kept current. Exact locations of all pipes and conduits and all changes in construction and details shall be indicated and dimensions provided upon these drawings, and all changes in materials and equipment installed shall be indicated in these specifications. Upon completion and prior to Acceptance of the Work, a final reproducible (transparencies) set of project record documents and specifications shall be submitted to the County by the Contractor. County will furnish a set of reproducibles.

c. The working details will indicate dimensions, position, and kind of construction, and the specifications, qualities, and methods. Any Work indicated on the working details and not mentioned in the specifications, or vice versa, shall be furnished as though fully set forth in both. Work not particularly detailed, marked, or specified shall be the same as similar work that is detailed, marked, or specified.

d. In case of discrepancy in the documents, the matter shall be promptly submitted to the County, who shall make a determination in writing. Any adjustment by the Contractor without such a determination shall be at its own risk and expense. The County shall furnish from time to time such detailed information as considered necessary to clarify the Work.

e. Where the word "similar" occurs on the drawings, it shall have a general meaning and not be interpreted as meaning identical, and all details shall be worked out in relation to their location and their connection with other parts of the work.

f. Standard details or specification drawings are applicable when listed, bound with specifications, noted on the drawings or referenced elsewhere in the specifications. Where the notes on the drawings indicate modifications, such modifications shall govern.

g. All drawings, specifications and copies thereof furnished to the Contractor are the property of the County and shall not be used on other work without its consent. Upon completion of this project, all copies of the drawings and specifications shall be returned to the County.

4.2 SUMMARY OF THE ORDER OF THE PROCEDURE

4.2.1 In case of conflicts between the Contract Documents, the order of precedence shall be as follows:

1) Modifications or changes last in time are first in precedence.
2) Addenda.
3) County-Contractor agreement.
4) General Conditions except for specific modifications thereto stated in the Supplementary Conditions.
5) Supplementary Conditions.
6) Division One Specifications.
7) Division Two through Sixteen Specifications.
8) Drawings - as between figured dimensions given on drawings and the scaled measurements, the figured dimension shall govern; as between large-scale drawings and small-scale drawings, the larger scale shall govern.
9) Structural drawings
10) Architectural drawings.
11) As between detailed drawings and typical details bound within the specifications, the detailed drawings govern.

12) In the event provisions of codes, safety orders, contract documents, referenced manufacturer's specifications or industry standards are in conflict, the more restrictive and higher quality shall govern.
13) Schedules shown on the drawings take precedence over conflicting information given on other drawings.
14) Mechanical drawings.
15) Electrical drawings.

4.3 CLARIFICATIONS/REQUEST FOR INFORMATION AND ADDITIONAL INSTRUCTIONS

4.3.1 NOTIFICATION BY CONTRACTOR

a. Should Contractor discover what he perceives to be conflicts, omissions, or errors in the Contract Documents, or have any question concerning interpretation or clarification of the Contract Documents, or if it appears that the work to be done or any matters relative thereto are not sufficiently detailed or explained in the Contract Documents, then, before proceeding with the work affected, Contractor shall notify County's authorized representative in writing, and request interpretation, clarification, or additional detailed information concerning the work. The Contractor shall ask for the clarification (Request for Information) immediately upon discovery but no less than 14 calendar days prior to the start date of the activities related to the clarification, based on the latest updated version of the accepted Progress Schedule. County, whose decision shall be final and conclusive, shall resolve such questions and issue instructions to Contractor. Should Contractor proceed with work affected before receipt of instructions from County, Contractor shall remove and replace or adjust work which is not in accordance with the instructions from County and shall be responsible for resultant damage, defect or added cost. In event of failure to agree as to scope of Contract requirements, Contractor shall follow the procedure set forth in the DISPUTES article.

b. The Contractor shall not be entitled to any compensation for delays, disruptions, inefficiencies or additional administrative effort caused by the Contractor's untimely review of the Contract Documents for potential conflicts, omissions, discrepancies or ambiguities.

c. County may charge back to the Contractor, time and expense associated with RFI's, as may be reasonably determined by the County to be unnecessary.

4.3.2 ADDITIONAL DETAILED INSTRUCTIONS

a. The County may furnish additional detailed written instructions on any Request for Information to further explain the Work. If in the opinion of Contractor, the additional detailed instructions constitute work in excess of the scope of the Contract, he must submit written notice thereof immediately to the County, but no later than seven (7) calendar days following receipt of such instruction(s), and in any event prior to commencement of work thereon. The Contractor shall not be entitled to additional compensation due to any additional instructions unless the Contractor shall have given the appropriate written notice. County will then consider such notice and, if in its judgment it is justified, the County instructions will be revised or extra work shall be authorized by Change Order. In the event of a dispute hereunder, attention is directed to the DISPUTES article.

ARTICLE 5 SHOP DRAWINGS AND SUBMITTALS

5.1 SHOP DRAWINGS, PRODUCT DATA, COORDINATION DRAWINGS AND SCHEDULES

5.1.1 Shop drawings are drawings submitted to the County by the Contractor showing detail of the proposed

fabrication and assembly of structural elements and the installation (i.e., form, fir, and attachment details) of materials or equipment. It includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, fabrication, erection and setting drawings, manufacturers' scale drawings, wiring and control diagrams, cuts or entire catalogs, pamphlets, and performance and test data, and similar materials furnished by the Contractor to explain in detail specific portions of the Work required by the Contract. The County may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this Contract.

5.1.2 The Contractor shall coordinate all shop drawings and review them for accuracy, completeness, and compliance with Contract requirements, and shall indicate its approval thereon as evidence of such coordination and review. Shop drawings submitted to the County without evidence of the Contractor's approval shall be returned for resubmission. The Architect will indicate review for compliance of the shop drawings, and if not in compliance as submitted, shall indicate the reasons therefore. Any work done before such review shall be at the Contractor's risk. Review by the Architect shall not relieve the Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this Contract, except with respect to variations described and approved in accordance with paragraph 5.1.3.

5.1.3 If shop drawings show any variations from the Contract requirements, the Contractor shall describe such variations in writing, separate from the drawings, at the time of submission. If the Architect approves any such variation, no change in time or price will be allowed for Contractor changes. Should the Architect make changes on the shop drawings which affect time and/or cost, the Contractor will immediately notify the County with a Request for Information. If the Contractor fails to issue the Request for Information within seven (7) calendar days from receipt of the returned shop drawing, the Contractor shall have waived his right to any potential Change Order.

5.1.4 The Contractor shall submit shop drawings, coordination drawings, and schedules for review as required by the Contract Documents. The Contractor will provide a submittal schedule listing all shop drawings and submittals, the submission dates by the Contractor, and return dates from the Architect. This schedule will be provided fourteen (14) calendar days after the Notice to Proceed.

5.1.5 Shop drawings and schedules, other than catalogs, pamphlets, and similar printed material, shall be submitted with one reproducible plus one copy.

5.1.6 Each shop drawing or coordination drawing shall have a blank area 4 by 4 inches located adjacent to the title block. The title block shall display the following:

1) Number and title of drawing
2) Date of drawing or revision
3) Name of project building or facility
4) Name of Contractor and (if appropriate) name of subcontractor submitting drawings
5) Clear identity of contents and location on the work
6) Project title and project number
7) Submittal number

5.1.7 Unless otherwise provided in this Contract or otherwise directed by County, shop drawings, coordination drawings, and schedules shall be submitted to the Architect with a letter, sufficiently in advance of construction requirements to permit no less than twenty (21) calendar days for checking and appropriate action.

5.2 SAMPLES

5.2.1 After the award of the Contract, the Contractor shall deliver samples required by the specifications to the County for approval. The Contractor shall prepay any shipping charges. Any materials or equipment for which

samples are required shall not be used in the Work until reviewed by County.

5.2.2 Each sample shall have a label indicating:

1) Name of project building or facility, project title, and project number.
2) Name of Contractor and, if appropriate, name of subcontractor.
3) Identification of material or equipment with specification requirement.
4) Place of origin.
5) Name of manufacturer and brand (if any).
6) Identify by specification section.

5.2.3 Samples of finished materials shall have additional markings that will identify them in reference to the finish schedules.

5.2.4 The Contractor shall mail a letter in triplicate under separate cover submitting each shipment of samples and containing the information required in paragraph 5.2.2. He shall enclose a copy of this letter with the shipment and send a copy to the County representative on the project. Approval of a sample shall be only for the characteristics or use named in such review and shall not be construed to change or modify any Contract requirement. Substitutions will not be permitted unless they are approved under paragraph 5.3.

5.2.5 Approved samples not destroyed in testing will be sent to the County. Approved samples of hardware in good condition will be marked for identification and may be used in the Work. Materials and equipment incorporated in the Work shall match the approved samples. Other samples not destroyed in testing or not approved will be returned to the Contractor at his expense if so requested at time of submission.

5.2.6 Failure of any material to pass the specified tests will be sufficient cause for refusal to consider any further samples of the same brand or make of that material or equipment under this Contract.

5.2.7 Samples of various materials or equipment delivered on the site or in place, may be taken by the County for testing. Samples failing to meet Contract requirements will automatically void previous approvals of the items tested. The Contractor shall replace such materials or equipment found not to have met Contract requirements, or there shall be a proper adjustment of the Contract price as determined by the County.

5.2.8 Unless otherwise specified, when tests are required, only one test of each sample proposed for use will be made at the expense of the County. Samples which do not meet specification requirements will be rejected. Requests for testing of additional samples by Contractor may be made by the County at the expense of the Contractor.

5.3 SUBSTITUTIONS

5.3.1 Wherever the name, or brand, or manufacturer of an article is specified in the Contract Documents, it is used as a measure of quality and utility or a standard. Except in those instances where the product is designated to match others presently in use, specifications calling for a designated material, product, thing or service by specific brand or trade name shall be deemed to be followed by the words "or equal" so that bidders may propose any equal material, product, thing or service in their bid. If the Contractor desires to use any other brand or manufacturer of equal quality and utility to that specified, he shall list definite particulars of that which he considers equivalent to the specified item in his bid. The Contractor shall have thirty-five (35) days after the award of the Contract for submission of data substantiating substitution of "equal" items. The County will then determine whether or not the proposed name brand or article is equal in quality and utility to that specified in the Contract Documents, and its written decision shall be final.

5.3.2 No proposal will be considered unless accompanied by complete information and descriptive data necessary to determine the equality of the offered materials, articles, or equipment. Samples shall be provided when

requested by the County.

5.3.3 The burden of proof as to the comparative quality or suitability of the offered materials, articles, or equipment shall be upon the Contractor. The County shall be the sole judge as to such matters. In the event that the County rejects the use of such alternative materials, articles, or equipment, then one of the particular products designated by brand name in the specifications shall be furnished.

5.3.4 The County will examine Contractor's submittals with reasonable promptness. Return of the submittals to the Contractor shall not relieve the Contractor from responsibility for deviations and alternatives from the Contract Documents nor shall it relieve him from responsibility for errors in the submittals. A failure by the Contractor to identify, in his letter of transmittal, material deviations from the Contract Documents shall void the submittal and any action taken thereon by the County. When specifically requested by the County, the Contractor shall resubmit such shop drawing(s), descriptive data, and samples as may be required.

5.3.5 If any mechanical, electrical, structural, or design revisions are required for the proper installation and fit of alternative materials, articles, or equipment, or because of deviations from the Contract Documents, such changes shall not be made without the consent of the County's authorized representative, and shall be made without additional cost to the County, such costs, including the fees of the Architect, to be borne by the Contractor.

ARTICLE 6 SCHEDULES

6.1 CONSTRUCTION SCHEDULE

6.1.1 The Contractor shall prepare and submit to the County a practicable schedule showing the order in which the Contractor proposes to perform the work, and the dates on which the Contractor contemplates starting and completing the salient features of the work (including acquiring materials and equipment). The schedule shall be in the form of a CPM (critical path method) schedule, of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period. The scheduled completion date shall be the same as the contractual completion date, for the initial schedule and subsequent updates. Any proposed early completion date shall show the difference between that date and the contract completion date as Float, which shall belong to both the County and Contractor.

6.1.2 If, in the opinion of the County, the Contractor falls behind the approved schedule, the Contractor shall take steps necessary to improve its progress, without additional cost to the County. The Contractor shall submit any supplementary schedule or schedules in CPM form as the County deems necessary to demonstrate how the approved rate of progress will be regained.

6.1.3 All schedule updates must accurately reflect the as-built schedule. There shall be no change to the Critical Path without the County's written consent.

ARTICLE 7 TIME, LIQUIDATED DAMAGES AND EXTENSIONS

7.1 TIME OF WORK

The Contractor shall commence work on this project immediately upon receipt of the written Notice to Proceed and shall perform the work diligently to completion within the number of calendar days specified in the Contract. Neither site access nor physical work shall be commenced before the Contract is fully executed, and bonds, insurance and the schedule are submitted as required by the Contract Documents. No work shall be done on Saturday, Sunday and holidays and no work shall be performed outside of normal working hours without the

prior written consent of the County, unless required by these Specifications. See: Working Hours.

7.2 LIQUIDATED DAMAGES

If the Work is not completed within the time required, damage will be sustained by the County. It is and will be impracticable and extremely difficult to ascertain and determine actual damage which County will sustain by reason of such delay; and it is therefore agreed that Contractor will pay to County the sum of $500.00 per day for each and every day's delay in finishing the Work beyond the time prescribed. If the Contractor fails to pay such liquidated damages, the County may deduct the amount thereof from any money due or that may become due the Contractor under the Contract.

7.3 UNAVOIDABLE DELAYS

7.3.1 TIME EXTENSION

a. The Contractor will be granted an extension of time for completion of the Work beyond that named in the Contract Documents, for delays which may result through causes beyond the control of the Contractor and which he could not have avoided by the exercise of care, prudence, foresight and diligence. The appropriate extension of time shall constitute full compensation. Costs associated with extended overhead will not be considered.

b. If the Contractor is allowed extensions of time in which to complete the Work equal to the sum of all unavoidable delays, plus any adjustments of contract time due to contract change orders, during such extension of time liquidated damages shall not be charged to the Contractor.

c. Unavoidable delays within the meaning of this section shall be those caused by Acts of God or of the public enemy, fire, epidemics, or strike. There will be no liquidated damages for delays as described within this paragraph.

d. Delays in the performance of parts of the work which may in themselves be unavoidable, but do not necessarily prevent or delay the performance of critical activity(s) while the activity(s) is on the Critical Path, will not be considered as unavoidable delays within the meaning of the contract and shall not be the basis of a claim for delay.

7.3.2 WEATHER

Inclement weather shall not be a prima facie reason for granting a time extension. The Contractor shall make every effort to continue work under prevailing conditions. However, if the inclement weather prevents the Contractor from beginning at the usual starting time, or prevents the Contractor from proceeding with seventy-five percent (75%) of the normal labor and equipment force towards completion of the day's current Critical Path activities (shown on the most current, and accepted schedule update) for a period of at least five (5) hours, and the crew is dismissed as a result thereof, the County will designate such time as unavoidable delay and grant a one (1) calendar day, non-compensable, time extension.

7.3.3 NOTICE OF DELAYS

a. Whenever the Contractor foresees any delay in the performance of a Critical Path work activity, and in any event immediately upon the occurrence of any delay which he regards as an unavoidable delay, the Contractor shall notify the County in writing of such delay and its

cause, in order that the County may take immediate steps to prevent, if possible, the occurrence or continuance of the delay, and may determine whether the delay is to be considered avoidable or unavoidable, how long it continues, and to what extent the prosecution and completion of the work are to be delayed thereby.

b. After the completion of any part or the whole of the Work, the County, in calculating the amount due the Contractor, will assume that any and all delays which have occurred have been avoidable delays, except such delays as shall have been called to the attention of the County at the time of their occurrence and found by the County to have been unavoidable as substantiated by a change order. The Contractor shall make no claims that any delay not called to the attention of the County at the time of its occurrence has been an unavoidable delay.

7.4 REQUEST FOR TIME EXTENSION

7.4.1 In the event the Contractor requests an extension of contract time for unavoidable delay, justification shall be submitted no later than seven (7) calendar days after the initial occurrence of any such delay. When requesting time for proposed change orders, the request(s) must be submitted with the proposed change order with full justification. If the Contractor fails to submit justification he shall waive his right to a time extension at a later date. Justification must be based on the currently accepted contract schedule as updated at the time of occurrence of delay or execution of work related to any change(s) in the scope of work. The justification must include a schedule, including, but not limited to, the following information:

a. The duration to perform the activity relating to the change(s) in the work and the resources (manpower, equipment, material, etc.) required to perform these activities within the stated duration.

b. Logical activity ties to the contract schedule for the proposed changes and/or delay showing the activity/activities in the schedule whose start or completion dates are affected by the change and/or delay.

7.4.2 The County, after receipt of such justification and supporting evidence, shall make its finding of fact. The County's decision shall be final and conclusive and the County will advise the Contractor in writing of such decision. If the County finds that the Contractor is entitled to any extension of Contract time, the County's determination as to the total number of days of extension shall be based upon the latest updated version of the approved contract schedule.

7.4.3 In the event the Contractor disagrees with the County's decision, the Contractor shall be required to submit a claim pursuant to the DISPUTE article.

ARTICLE 8 PERFORMANCE

8.1 SUPERVISION & CONSTRUCTION PROCEDURES

8.1.1 The Contractor shall supervise and direct the work. The Contractor shall be solely responsible for all construction means, methods, techniques, sequences, procedures, project safety, and shall coordinate all portions of the Work under the Contract, including the relations of the various trades to the progress of the Work, in accordance with the provisions of the Contract Documents.

8.1.2 The Contractor shall be responsible to the County for the acts and omissions of the Contractor's employees, subcontractors, and their agents and employees, and any other persons performing any of the work under a

contract with the Contractor.

8.1.3 The Contractor is an independent contractor and nothing in the Contract Documents shall be interpreted to make the Contractor an agent of the County.

8.2 SUPERVISION

8.2.1 Within seven (7) days after the Notice to Proceed, the Contractor shall provide to the County an organization chart outlining key job personnel. The Contractor will also provide a Letter of Authority or Corporate Resolution for the individual(s) authorized to sign documents on its behalf, i.e., payment requests, change orders, inspection reports, etc.

8.2.2 The Contractor shall employ, during the progress of the Work, a competent Project Superintendent and any necessary assistants, as approved by the County. The Project Superintendent shall not be changed except with the consent of the Authorized Representative of County, unless the Superintendent proves to be unsatisfactory to the Contractor or ceases to be in his employ. The County shall be notified immediately of any new Superintendent appointed to the Work and the Contractor shall submit qualifications for approval. The Superintendent shall represent the Contractor and all directions given to him shall be as binding as if given to the Contractor.

8.2.3 The County shall be supplied at all times with the name and telephone number of a person in charge of or responsible for the Work, who can be reached for emergency work twenty-four (24) hours a day, seven (7) days a week.

8.3 CONDUCT OF WORK

8.3.1 In connecting one kind of work with another, marring or damaging same will not be permitted and, in the event such occurs, shall be corrected by the Contractor at its cost prior to acceptance by the County. Should improper work of any trade be covered by another which results in damage or defects, the whole work affected shall be made good by the Contractor without expense to County.

8.4 PROTECTION OF WORK & PROPERTY

8.4.1 The Contractor shall continuously maintain adequate protection of the Work from damage and shall protect the County's property from injury or loss in connection with this Contract. He shall make good any such damage, injury, or loss, except what may be directly due to errors in the Contract Documents or caused by agents or employees of the County. He shall adequately protect adjacent property as provided by law and the Contract Documents.

8.4.2 The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the Work site which are not to be removed and which do not unreasonably interfere with the work required under this Contract.

8.4.3 The Contractor shall protect from damage all existing improvements and utilities at or near the Work site and on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this Contract or failure to exercise reasonable care in performing the Work. If the Contractor fails to repair the damage promptly, the County may have the necessary work performed and charge the cost to the Contractor.

8.5 CONTRACTOR'S RESPONSIBILITY FOR WORK

8.5.1 Until Acceptance of the Work by the County, Contractor shall have the charge and care thereof and shall bear risk of injury or damage to any part of the Work by action of the elements. If a separate Contractor sues the Owner, on account of any loss so sustained, the County shall notify the Contractor, who shall indemnify and hold harmless the County against any expenses, or judgment arising therefrom.

8.5.2 Contractor, at its cost, shall rebuild, repair, restore and make good all damages from the elements to any portion of the Work occasioned by such causes before its Acceptance.

8.5.3 No advertising of any description will be permitted in or about the Work, except by order of the County.

8.5.4 Contractor shall not create or permit the continued existence of any nuisance in or about the Work.

8.6 UTILITIES

8.6.1 Unless otherwise provided for under separate sections herein, Contractor will arrange all water, gas, and electricity required for construction purposes until acceptance of the Work. Contractor shall pay for such services unless otherwise specifically noted.

8.6.2 Utilities shall not be interrupted except with the approval of the County. A two (2) work day written notice is required prior to any and all interruptions. Interruptions shall be scheduled so as to minimize duration and disruption to existing operations.

8.6.3

a. The Contractor shall send notices, make all necessary arrangements, and perform all other services required in the care and maintenance of all public utilities.

b. Enclosing or boxing in, for protection of any public utility equipment, shall be done by the Contractor. Upon completion of the Work, the Contractor shall remove all enclosures, and leave in a finished condition.

c. All connections to public utilities shall be made and maintained in a manner so as not to interfere with the continuing use of same by the County during the entire progress of the Work.

8.7 WORKING HOURS

8.7.1 All work shall be performed on a calendar day basis during the customary working hours of the trades involved unless otherwise specified in this Contract. Work performed by the Contractor of his own volition outside such established working hours shall be at no additional expense to the County and without County approval.

8.7.2 It is expressly stipulated that no laborer, workman, or mechanic employed at any time by the Contractor or by any subcontractor(s) under this Contract upon the Work or any part thereof, shall be required or permitted to work thereon more than eight (8) hours during any one calendar day and forty (40) hours during any one calendar week, except, as provided by Section 1815 of the California Labor Code. It is further expressly stipulated that for each and every violation of Sections 1811-1815, inclusive, of the California Labor Code, all the provisions of which are deemed to be incorporated herein, said contractor shall forfeit, as a penalty to County, twenty-five dollars ($25.00) for each laborer, workman, or mechanic employed in the execution of this Contract by contractor for each calendar day during which said laborer, workman, or mechanic is required or permitted to work more than eight hours in any one calendar day and forty hours in any one calendar week in violation of the provisions of said Sections of the Labor Code.

8.7.3 The Contractor, and each subcontractor, shall keep an accurate record showing the names of and actual hours worked each calendar day and each calendar week by all laborers, workmen, and mechanics employed by them in connection with the Work contemplated by this Contract, which record shall be open at all reasonable hours to the inspection of the County or its officers or agents and to the Division of Labor Standards Enforcement of the Department of Industrial Relations.

8.7.4 No construction work shall be done on Saturdays, Sundays or County holidays and no work shall be performed outside of normal working hours without the prior written consent of the County. In any event, all work shall be subject to approval of the County. Prior to start of such work, the Contractor shall arrange with the County for the continuous or periodic inspection of the Work and testing of materials, when necessary. If requests are made by the Contractor for permission to work overtime, nights, Saturdays, Sundays or County holidays, and such requests are granted, the Contractor shall bear all extra expense to the County for inspection and other incidental expenses caused by such overtime work. If contractors are requested, in the interest of the County, to work overtime by the County, or if overtime work is specifically required by these specifications, all extra expense of inspection will be paid by the County.

8.8 MATERIAL & EQUIPMENT

8.8.1 Materials, equipment, and articles incorporated into the Work shall be new and of equal quality to the types and grades specified. When not particularly specified, the Contractor shall submit for approval satisfactory evidence as to the kind and quality of material. See SUBSTITUTION provision 5.3 concerning "or equal" requirements and procedure for submitting alternative material, articles, or equipment.

8.8.2 All materials shall be delivered so as to insure a speedy and uninterrupted progress of the Work. All materials shall be stored so as to cause no obstruction and so as to prevent overloading of any portion of the structure on the Work site, and the Contractor shall be entirely responsible for damage or loss by weather, theft, vandalism, or other cause.

8.8.3 Materials shall be stored to assure the preservation of their quality and fitness for the Work. Stored materials shall be reasonably accessible for inspection. When considered necessary by the County, stored materials shall be placed on wooden platforms or on other hard, clean surfaces and not directly on the ground, and shall be placed under cover when so directed.

8.9 LAYOUT OF WORK

8.9.1 The Contractor shall lay out its work from established base lines and bench marks indicated on the drawings, and shall be responsible for all measurements in connection with the layout. The Contractor shall furnish, at its own expense, all stakes, templates, platforms, equipment, tools, material, and labor required to lay out any part of the Work. The Contractor shall be responsible for executing the Work to the lines and grades that may be established or indicated in the Contract Documents. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks established by the County until authorized to remove them. If such marks are destroyed by the Contractor before their removal is authorized, the County may replace them and deduct the expense of the replacement from any amounts due or to become due to the Contractor.

8.10 USE OF PREMISES

8.10.1 The Contractor shall maintain the entire premises under his control in an orderly condition. He shall store his apparatus, materials, supplies and equipment in such a manner as will not interfere with the progress of his work or the work of other contractors.

8.11 OPERATIONS & STORAGE

8.11.1 The Contractor shall confine all operations (including storage of materials) on County premises to areas authorized or approved by the County.

8.11.2 Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the Contractor only with the approval of the County and shall be built with labor and materials furnished by the Contractor without expense to the County. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at his expense upon completion of the work.

8.11.3 The Contractor shall, under regulations prescribed by the authority having jurisdiction, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the authority having jurisdiction. When materials are transported in performance of the Work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or County regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair, or pay for the repair, of any damaged curbs, sidewalks, or roads.

8.12 HEAT/POWER/LIGHT

8.12.1 Unless otherwise specified or already provided by the County, the Contractor shall:

a. Provide heat, as necessary to protect all work, materials, and equipment against injury from dampness and cold;

b. Provide heat as necessary in the area where work is to be done to provide the minimum temperature recommended by the supplier or manufacturer of the material;

c. Provide electric power and light as required for performance of the Work.

8.13 CLEANING UP

8.13.1 The Contractor shall at all times keep the work area, including storage areas, free from accumulations of waste materials. Before completing the Work, the Contractor shall remove from the work and premises any weeds, rubbish, tools, scaffolding, equipment, and materials that are not the property of the County. Upon completing the Work, the Contractor shall leave the work area in a clean, neat, and orderly condition satisfactory to the County.

ARTICLE 9 SAFETY & HEALTH

9.1 ACCIDENT PREVENTION

9.1.1 In performing this Contract, the Contractor shall provide for protecting the lives and health of employees and other persons; preventing damage to property, materials, supplies, and equipment; and avoiding work interruptions. For these purposes, the Contractor shall:

a. Provide a copy of its safety program;

b. Provide appropriate safety barricades, signs, and signal lights;

c. Comply with standards issued by the U.S. Government, State, County and City, and other governing agencies having jurisdiction;

d. Ensure that any additional measures the County determines to be reasonably necessary for this purpose are taken.

9.1.2 The Contractor shall maintain an accurate record of exposure data on all accidents incident to work performed under this Contract resulting in death, traumatic injury, occupational disease, or damage to property, materials, supplies, or equipment. The Contractor shall report this data in the manner prescribed by the County.

9.1.3 Before beginning excavation for a trench 5 feet or more in depth, Contractor shall provide evidence of having obtained a permit from the authority having jurisdiction.

9.1.4 Nothing herein shall be deemed to allow use of shoring, sloping, or protective systems less effective than those required by the Construction Safety Orders of the California Division of Industrial Safety.

9.2 SANITARY FACILITIES

9.2.1 Contractor shall supply and maintain at its expense such toilets and other sanitary facilities including those which are accessible by the disabled as per ADA and Title 24 requirements necessary for use by visitors and workers employed at the job site. Such facilities shall be approved by the County.

9.3 RESPONSIBILITY FOR COMPLIANCE WITH CAL-OSHA

9.3.1 All work, materials, work safety procedures and equipment shall be in full accordance with the latest Cal-OSHA rules and regulations.

9.3.2 Contractor warrants that he and each of his subcontractors shall, in performance of this Contract, comply with each and every compliance order issued pursuant to Cal-OSHA. The Contractor assumes full and total responsibility for compliance with Cal-OSHA standards by his subcontractors as well as himself. The cost of complying with any order and/or payment of any penalty assessed pursuant to Cal-OSHA shall be borne by the Contractor. Nothing contained therein shall be deemed to prevent the Contractor and his subcontractors from otherwise allocating between themselves responsibility for compliance with Cal-OSHA requirements; provided, however, that the Contractor shall not thereby, in any manner whatsoever, be relieved of his responsibility to the County as herein set forth.

9.4 TOXIC AND HAZARDOUS MATERIALS AND WASTE

9.4.1 ASBESTOS

Operations which may cause release of asbestos fibers into the atmosphere shall meet the requirements of Title 8 CCR General Industrial Safety Orders, Section 5208 and California law. Some operations which may cause such concentrations include sanding, grinding, abrasive blasting, sawing, drilling, shoveling, or otherwise handling materials containing asbestos so that dust will be raised.

9.4.2 TOXIC MATERIALS

Operations which release toxic materials into the atmosphere shall meet the requirements of Title 8 CCR, General Industrial Safety Orders. Some operations which may release such materials include use of adhesives, sealants, paint, and other coatings.

9.4.3 LEAD-BASED PAINT

Lead-based paint is prohibited. Lead-based paint is defined as:

a. Any paint containing more than five-tenths of one percentum lead by weight (calculated as lead metal in the total non-volatile content of the paint) or the equivalent measure of lead in the dried film of paint applied or both; or

b. For paint manufactured after June 22, 1977, any paint containing more than six one-hundredths of one percentum lead by weight (calculated as lead metal) in the total content of the paint or the equivalent measure of lead in the dried film or paint already applied.

9.4.4 HAULING AND DISPOSAL

All hauling and disposal shall meet requirements of Title 22 CCR, Division 4. Chapter 30, "Minimum Standards for Management of Hazardous and Extremely Hazardous Wastes."

9.4.5 ASBESTOS PROHIBITED

No products or materials containing asbestos shall be incorporated into the Work without the prior written approval of the County.

ARTICLE 10 COUNTY-FURNISHED PROPERTY

10.1 COUNTY-FURNISHED PROPERTY

10.1.1 The County may furnish to the Contractor property as identified in the specification(s) to be incorporated or installed into the Work or used in performing the Contract. The listed property will be furnished f.o.b. railroad cars at the place specified in the Contract or f.o.b. truck at the project site. The Contractor is required to accept delivery. When the property is delivered, the Contractor shall verify its quantity and condition and acknowledge receipt in writing to the County within twenty-four (24) hours of delivery, also specifying any damage to or shortage of the property as received. All such property shall be installed or incorporated into the Work at the expense of the Contractor, unless otherwise indicated in this Contract.

10.1.2 Each item of property to be furnished under this clause shall be identified by the Contractor in a schedule by quantity, item, and description. Schedule form will be provided by the County.

10.1.3 The Contractor shall be held responsible for all material delivered to him and deductions will be made from any moneys due him to make good any shortages and deficiencies, from any cause whatsoever, which may occur after such delivery.

10.1.4 The Contractor shall set up accounting records and establish an inspection procedure as approved by the County.

ARTICLE 11 BENEFICIAL OCCUPANCY

11.1 BENEFICIAL OCCUPANCY

11.1.1 The County shall have the right to take possession of or use any completed or partially completed portion of the Work. The County's possession or use shall not be deemed an acceptance of any Work under the Contract. The Contractor will continue to pay for any portion of the utilities which he is using.

11.1.2 While the County has such possession or use, the Contractor shall be relieved of the responsibility for the loss of

or damage to that portion of the Work resulting from the County's possession or use. If Contractor believes the partial possession or use by the County will delay the progress of the Work or will cause additional expense to the Contractor, Contractor shall immediately submit a written request for an equitable adjustment in the Contract price or the time of completion. County will then consider such request and, if in its judgment it is justified, the County will modify the contract in writing accordingly. In the event the Contractor disagrees with the County's decision, the Contractor shall be required to submit a claim pursuant to the DISPUTE article.

ARTICLE 12 INSPECTION AND TESTING

12.1 INSPECTION AND TESTING

12.1.1 The Contractor shall maintain an adequate inspection system and perform such inspections as will ensure that the work called for by this Contract conforms to contract requirements. The Contractor shall maintain complete inspection records and make them available to the County. The County shall at all times have access to the Work, and the Contractor shall provide proper facilities for such access and for inspection.

12.1.2 County inspections and tests are for the sole benefit of the County and do not:

a. Relieve the Contractor of responsibility for providing adequate quality control measures;

b. Relieve the Contractor of responsibility for damage to or loss of the material before Acceptance;

c. Constitute or imply Acceptance; or

d. Affect the continuing rights of the County after Acceptance regarding latent defects, gross mistakes, fraud or the County's rights under any warranty or guarantee.

12.1.3 The presence or absence of a County inspector does not relieve the Contractor from any Contract requirement, nor is the inspector authorized to change any term or condition of the specifications without the County's written authorization.

12.1.4 The Contractor shall promptly furnish, without additional charge, all facilities, labor, and material reasonably needed for performing such safe and convenient inspections and tests as may be required by the County. The County may charge to the Contractor any additional cost of inspection or test when work is not ready at the time specified by the Contractor for inspection or test, or when prior rejection makes reinspection or retest necessary. Special, full size, and performance tests shall be performed as described in the Contract.

12.1.5 The Contractor shall, without charge, replace or correct work found by the County not to conform to contract requirements, unless in the public interest the County consents to accept the work with an appropriate adjustment in Contract price. The Contractor shall promptly segregate and remove rejected material from the premises.

12.1.6 If, before Acceptance of the Work, the County decides to examine already completed work by removing it or tearing it out, the Contractor, on request, shall promptly furnish all necessary facilities, labor, and material. If the work is found to be defective or nonconforming in any material respect due to the fault of the Contractor or its subcontractors, the Contractor shall defray the expenses of the examination and of satisfactory reconstruction. However, if the work is found to meet Contract requirements, the County shall issue a Change Order for such removal and reinstallation.

12.1.7 The Contractor shall at all times maintain proper facilities and provide safe access for inspection by the County

to all parts of the work, and to the shops wherein the work is in preparation. Where the specifications require work to be specially tested or approved, it shall not be tested or covered up without timely notice to the County of its readiness for inspection and without the approval or consent of County. Should any such work be covered up without such notice, approval, or consent, it must, if required by County, be uncovered for examination at the Contractor's expense.

12.1.8 The Contractor shall notify the County at least one (1) work day in advance of the time scheduled for the inspection. Should the Contractor fail to notify the County and proceed with work requiring inspection, all such work is rejected, and no further work shall be done on that portion of the project until the rejected work is accepted by the County. Should the Contractor request acceptance of such rejected work the County shall, at the Contractor's expense, secure the services of private material testing laboratories, consulting engineers or licensed land surveyors, who shall certify that said work does in fact conform to the requirements of the Contract Documents. The work previously rejected shall be accepted by the County after receipt of such certification if the County approves of such certification.

12.1.9 If the Contractor does not promptly replace or correct rejected work, the County may (1) by contract or otherwise, replace or correct the work and charge the cost to the Contractor or (2) terminate for default the Contractor's right to proceed.

12.1.10 Construction review of the Contractor's performance by the County is not intended to include the review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.

12.1.11 The County will pay for initial testing services specified to be performed by the County. When initial tests indicate non-compliance with the Contract Documents, subsequent retesting occasioned by the non-compliance shall be performed by the same testing agency, and costs thereof will be deducted by the County from the Contract sum.

12.2 INSPECTION BY OTHER JURISDICTIONS

Whenever any part of the Work to be performed is under the jurisdiction or control of another public entity, including but not limited to: The United States Government, State of California, or City, such work shall be subject to inspection by the officials of such entities and it must pass inspection, in addition to County inspection, and such other inspections as may otherwise be provided for in the Contract Documents.

12.3 FINAL INSPECTION AND TESTS

The Contractor shall give the County at least ten (10) calendar days advance written notice of the date the Work will be fully completed and ready for final inspection and tests. Final inspection and tests will be started within ten (10) calendar days from the date specified in the aforementioned notice unless the County determines that the Work is not ready for final inspection and so informs the Contractor.

ARTICLE 13 ACCEPTANCE

13.1 ACCEPTANCE OF THE WORK

13.1.1 After the final inspection by County and all the contract documentation has been received, it will be recommended to the County Board of Supervisors to accept the Work and file a Notice of Completion. Upon approval of the Notice of Completion, a copy will be sent to the Contractor. (See final payment clause.) Upon Acceptance of the Work, Contractor will be relieved of the duty of maintaining and protecting the Work. Neither determination by the County that the Work is complete, nor Acceptance thereof, shall operate as a bar to County's claim against Contractor pursuant to Contractor's warranty and guarantees.

13.1.2 Partial payments shall not be construed as acceptance of any part of the Work.

13.1.3 In judging the Work, no allowance for deviations from the drawings and specifications will be made, unless already approved in writing at the time and in the manner as called for herein.

13.1.4 County shall be given adequate opportunity to make any necessary arrangements for fire insurance and extended coverage.

13.1.5 The Acceptance of the Work will not be recommended until all requirements of the Contract Documents are complete and approved by the County. This shall include, but is not limited to, all construction, guarantee forms, parts lists, schedules, tests, operating instructions, as-built drawings, and all other documentation identified by the Contract Documents.

ARTICLE 14 WARRANTY AND GUARANTEES

14.1 CONTRACTOR'S WARRANTY AND GUARANTEE

14.1.1 Contractor warrants that all materials and equipment furnished under this Contract shall be new unless otherwise specified, and that all Work performed under this Contract conforms to the Contract requirements and is free of any defect whether performed by the Contractor or any subcontractor or supplier.

14.1.2 This warranty shall continue for a period of one (1) year from the date of filing of Notice of Completion on the Work. The Performance Bond shall remain in force during the warranty period.

14.1.3 The Contractor shall remedy at the Contractor's expense any damage to County-owned or controlled real or personal property, when that damage is the result of:

a. The Contractor's failure to conform to Contract requirements or

b. Any defect of equipment, material, workmanship, or design furnished by the Contractor.

14.1.4 The Contractor shall restore any work damaged in fulfilling the terms and conditions of this Article. The Contractor's warranty with respect to work repaired or replaced will run for one (1) year from the date of repair or replacement.

14.1.5 The County shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage. The Contractor shall within ten (10) calendar days after being notified in writing by the County of any work not in accordance with the requirements of the Contract or any defects in the Work, commence, and perform with due diligence, all work necessary to fulfill the terms of this Article. If the Contractor fails to remedy any defect, or damage within fourteen (14) calendar days after receipt of notice, the County shall have the right to replace, repair, or otherwise remedy the defect, or damage at the Contractor's expense. Payment due to the Architect from the County for extra architectural services required in the enforcement of Contractor's guarantee after Acceptance of the Work shall be paid to the County by the Contractor.

14.1.6 In the event of any emergency constituting an immediate hazard to health or safety of County employees, property, or licensees, when caused by work of the Contractor that is not in accordance with the Contract requirements, the County may undertake at Contractor's expense and without prior notice, all work necessary to correct such hazardous condition(s).

14.1.7. With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this Contract, the Contractor shall:

a. Obtain all warranties that would be given in normal commercial practice;

b. Require all warranties to be executed, in writing, for the benefit of the County, unless directed otherwise by the County; and

c. Enforce all warranties for the benefit of the County, unless otherwise directed by the County.

14.1.8 This warranty shall not limit the County's rights under the Inspection and Acceptance section(s) of this Contract with respect to latent defects, gross mistakes, or fraud.

ARTICLE 15 ENVIRONMENTAL PROTECTION

15.1 DUST CONTROL

15.1.1 The Contractor shall provide any and all dust control required.

15.1.2 Whenever the Contractor is negligent in providing dust control, the County shall order the Contractor to provide such dust control. If the Contractor does not comply promptly with such order, the County shall have the authority to provide such dust control and charge the Contractor therefore by deducting the cost from progress payments to the Contractor as such costs are incurred by the County. The County shall not be held responsible for schedule delays due to actions taken by County to mitigate the failure of the Contractor in providing dust control.

15.2 EXCESSIVE NOISE

15.2.1 The Contractor shall use only such equipment on the Work and in such state of repair, that the emission of sound therefrom is within the noise tolerance level of that equipment as established by CAL-OSHA.

15.2.2 Should the County determine that the muffling device on any equipment used on the Work is ineffective or defective so that the noise tolerance of such equipment is exceeded, such equipment shall not, after such determination by the County, be used on the Work until its muffling device is repaired or replaced so as to bring the noise tolerance level of such equipment within such standards.

15.3 POLLUTION CONTROL, CLEANING

15.3.1 The Contractor shall not, in connection with the Work, discharge any smoke, dust, or other contaminants into the atmosphere which are in violation of South Coast Air Quality Management District standards or discharge any fluids or materials into any lake, river, stream, or channel as will violate regulations of State of California Water Resources Board. The Contractor shall control accumulation of waste materials and rubbish and dispose of waste materials and rubbish off-site at a minimum of weekly intervals. Burning of materials is not permitted.

ARTICLE 16 EMPLOYMENT PRACTICES

16.1 QUALIFICATIONS FOR EMPLOYMENT AND APPRENTICESHIP STANDARDS

16.1.1 In accordance with Section 1735 of the California Labor Code, no person under the age of 16 years and no person currently serving sentence in a penal or correctional institution shall be employed to perform any Work

under this Contract. No person whose age or physical condition is such as to make his employment dangerous to his health or safety or to the health or safety of others shall be employed to perform Work under this Contract; provided that this requirement shall not operate against any physically handicapped persons otherwise employable where such persons may be safely assigned to Work which they ably perform.

16.1.2 This contract is subject to the provisions of Sections 1777.5 and 1777.6 of the California Labor Code concerning the employment of apprentices by the Contractor or any subcontractor under him. Section 1777.5 as amended, requires the Contractor or subcontractor employing tradesmen in any apprenticeable occupation to apply to the Joint Apprenticeship Committee nearest the site of this project and which administers the apprenticeship program in that trade for a certificate of approval. The certificate will also fix the ratio of apprentices to journeymen that will be used in the performance of the Contract.

16.1.3 The Contractor is required to make contributions to funds established for the administration of apprenticeship programs if he employs registered apprentices or journeymen in any apprenticeable trade on such contracts and if other contractors on the public works site are making contributions.

16.1.4 All employees engaged in work on the project under this Contract shall have the right to organize and bargain collectively through representatives of their own choosing, and such employees shall be free from interference, restraint, and coercion of employers in the designation of such employees for the purpose of collective bargaining or other mutual aid or protection, and no person seeking employment under this Contract shall be required as a condition of initial or continued employment to join any company, union, or to refrain from joining, organizing, or assisting a labor organization of such person's own choosing. No person in the employment of the County shall be employed by this contractor.

16.2 WAGES & RECORDS

16.2.1 WAGE RATES

a. Pursuant to Section 1770 and 1773 et seq. of the Labor Code of the State of California, the Director of Industrial Relations has ascertained the general prevailing rate of per diem wages and the rates for overtime and holiday work in the locality in which the work is to be performed for each craft, classification, or type of workman needed to execute the contract which will be awarded to the successful bidder, copies of which are on file and available upon request at the Clerk of the Board, Board of Supervisors, 4080 Lemon St., 14th Floor, Riverside, CA 92501-3655, and shall be posted at the job site.

b. It shall be mandatory upon the Contractor and upon any subcontractor under him, to pay not less than the said specified rates to all laborers, workmen, and mechanics employed in the execution of the Contract. It is further expressly stipulated that the Contractor shall, as a penalty to County, forfeit twenty-five dollars ($25.00) for each calendar day, or portion thereof, for each laborer, workman, or mechanic paid less than the stipulated prevailing rates for any work done under this Contract by him or by any subcontractor under him; and Contractor agrees to comply with all provisions of Section 1770 et. seq. of the Labor Code.

c. In case it becomes necessary for the Contractor or any sub-contractor to employ on the project under this Contract any person in a trade or occupation (except executives, supervisory, administrative, clerical, or other non-manual workers as such) for which no minimum wage rate is herein specified, the Contractor shall immediately notify the County who will promptly thereafter determine the prevailing rate for such additional trade or occupation and shall furnish the Contractor with the minimum rate based thereon. The minimum rate thus furnished shall be applicable as a minimum for such trade or occupation

from the time of the initial employment of the person affected and during the continuance of such employment.

d. The County will not recognize any claim for additional compensation because of the payment by the Contractor of any wage rate in excess of the prevailing wage rate set forth as provided herein. The possibility of wage increases is one of the elements to be considered by the Contractor in determining his bid, and will not under any circumstances be considered as the basis of a claim against the County on the Contract.

16.2.2 WAGE RECORDS

a. The Contractor and each subcontractor shall keep or cause to be kept an accurate record (certified payroll) showing the names and occupations of all laborers, workers, and mechanics employed by him in connection with the execution of this Contract or any subcontract thereunder. The record shall show the actual per diem wages paid to each of said workers, which records shall be provided to the County, and to the Division of Labor Standards Enforcement upon its request. Copies provided will include one which has the name and social security numbers marked out.

16.3 NOTICE OF LABOR DISPUTES

16.3.1 If the Contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay the timely performance of this Contract, the Contractor shall immediately give notice, including all relevant information, to the County.

16.3.2 The Contractor agrees to insert the substance of this clause, including this paragraph into any subcontract in which a labor dispute may delay the timely performance of this Contract; except that each subcontract shall provide that in the event its timely performance is delayed or threatened by delay by any actual or potential labor dispute, the subcontractor shall immediately notify the next higher tier subcontractor or the prime Contractor, as the case may be, of all relevant information concerning the dispute.

16.4 NONDISCRIMINATION

16.4.1 EQUAL EMPLOYMENT OPPORTUNITY

a. Contractor agrees for the duration of this Contract that it will not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, age, political affiliation, marital status, or handicap. The Contractor will take affirmative action to insure that employees are treated during employment or training without regard to their race, color, religion, sex, national origin, age, political affiliation, marital status, or handicap. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

b. The Contractor will in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, age, political affiliation, marital status, or handicap.

c. The Contractor will send to each labor union or other representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice advising the workers' representative of the Contractor commitments under this agreement.

d. The Contractor agrees that it will comply with the provisions of Titles VI and VII of the Civil Rights Act, Revenue Sharing Act Title 31, U.S. Code Section 2716, and California Government Code Section 12990.

e. The Contractor agrees that it will assist and cooperate with the County, the State of California and the United States Government in obtaining compliance with the equal opportunity clause, rules, regulations, and relevant orders of the State of California and United States Government issued pursuant to the Acts.

f. In the event of the Contractor's non-compliance with the discrimination clause, the affirmative action plan of this contract, or with any of the said rules, regulations or orders, this Contract may be canceled, terminated, or suspended in whole or in part by the County.

16.4.2 HANDICAPPED NON-DISCRIMINATION

This project is subject to Section 504 of the Rehabilitation Act of 1973 as amended, (29 U.S.C. 794), and the Americans with Disabilities Act of 1990, as amended, and all requirements imposed by the guidelines and interpretations issued thereto. In this regard, the County and all of its contractors and subcontractors will take all reasonable steps to ensure that handicapped individuals have the maximum opportunity for the same level of aid, benefit or service as any other individual.

16.4.3 FAIR EMPLOYMENT AND HOUSING ACT ADDENDUM

In the performance of this Contract, the Contractor will not discriminate against any employee or Applicant for employment because of race, sex, color, religion, ancestry, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, sex, color, religion, ancestry, or national origin. Such action shall include, but not limited to, the following: employment, upgrading, emotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor shall post in conspicuous places, available to employees and applicants for employment, notices to be provided by the State or local agency setting forth the provisions of this Fair Employment and Housing Section.

16.4.4 ACCESS TO RECORDS

The Contractor will permit access to his records of employment, employment advertisements, application forms, and other pertinent data and records by the State Fair Employment and Housing Commission, or any other agency of the State of California designated by the awarding authority, for the purposes of investigation to ascertain compliance with the Fair Employment and Housing section of this Contract.

16.4.5 REMEDIES FOR WILLFUL VIOLATION

The State or local agency may determine a willful violation of the Fair Employment and Housing provision to have occurred upon receipt of a final judgment having that effect from a court in an action to which Contractor was a party, or upon receipt of a written notice from the Fair Employment and Housing Commission that it has

investigated and determined that the Contractor has violated the Fair Employment and Housing Act and has issued an order or obtained an injunction under Government Code Sections 12900, et seq.

ARTICLE 17 SUBCONTRACTING

17.1 SUBCONTRACTORS

17.1.1 A subcontractor is an individual, firm or corporation having a direct contract with the Contractor or with any other subcontractor for the performance of a part of the Work. In accordance with Section 4104 of the Public Contract Code, each Contractor, in his bid, shall include the name and location of each subcontractor who will perform work or labor, or render services to the Contractor in or about the Work in an amount in excess of one half of 1% of the Contractor's total bid.

17.1.2 The County reserves the right to approve all subcontractors. Such approval shall be a consideration to the awarding of the Contract and unless notification to the contrary is given to the Contractor prior to the signing of the Contract, the list of subcontractors which is submitted with his proposal will be deemed to be acceptable.

17.1.3 The Contractor shall be as fully responsible to the County for the acts and omissions of his subcontractors and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.

17.1.4 Nothing contained in the Contract Documents shall create any contractual relationship between any subcontractor and the County.

17.1.5 The divisions or sections of the specifications are not intended to control the Contractor in dividing the Work among subcontractors or to limit the work performed by any trade.

17.2 RELATIONS OF CONTRACTOR AND SUBCONTRACTOR

17.2.1 The Contractor agrees to bind every subcontractor by the terms of the Contract with the County, the General Conditions, Supplementary Conditions, and the drawings and specifications as far as applicable to his work, unless specifically noted to the contrary in a subcontract approved in writing as adequate by the County.

17.3 SUBCONTRACTS

17.3.1 Pursuant to the provisions of Sections 4100 to 4114 of the California Public Contract Code, inclusive, the Contractor shall not, without the consent of the County, either:

a. Substitute any persons as subcontractors in place of the subcontractors designated in his original bid without the consent of County. (The County's consent can only be given in cases permitted by Public Contract Code Section 4107.)

b. Permit any subcontract to be assigned or transferred or allow any work to be performed by anyone other than the original subcontractor listed in his bid.

c. Sublet or subcontract any portion of the work in excess of one-half of one percent of his bid to which his original bid did not designate a subcontractor.

Should the Contractor violate any of the provisions of Sections 4100 to 4114, inclusive, of the Public Contract Code, his so doing shall be deemed a violation of this Contract, and the County may either cancel the contract, or assess the Contractor a penalty in the amount of not more than ten (10) percent of the amount of the

subcontract involved, or both.

ARTICLE 18 TAXES

18.1 SALES AND PAYROLL TAXES

18.1.1 Each Contractor, subcontractor, and material dealer shall include in their bid all applicable taxes including but not limited to sales tax and payroll taxes required by law.

ARTICLE 19 CHANGES

19.1 CHANGE ORDER WORK

19.1.1 The County reserves the right to make changes in the work without impairing the validity of the Contract. The County may make changes to the work, or suspend the work, and all such changes or suspension are within the contemplation of the parties and will not be a basis for compensable delay. Such changes may be made in accordance with any of the following methods:

a. By written change order to the Contract ordered by the Board of Supervisors.

b. By written change order, signed by the Assistant County Executive Officer/EDA, in the manner and amounts specified by Board Policy B-11.

c. By written authorization, issued by the Assistant County Executive Officer/EDA, for items of work done under unit prices. The cost or credit for such added or omitted work shall be determined by multiplying the number of units added to or omitted from the work by the applicable unit price.

19.1.2 Upon receipt of a proposed Change Order from County, the Contractor shall submit a proposal in accordance with the requirements and limitations set forth in this "Change Orders" article, for work involved in the contemplated change.

19.1.3 The Contractor must submit a cost proposal within fifteen (15) calendar days after receipt of the proposed change order. The Contractor must submit cost proposals in less than fifteen (15) calendar days if requested by the County or if required by schedule limitations.

19.1.4 If the Contractor fails to submit the cost proposal within the 15-day period (or as requested), the County has the right to order the Contractor in writing to commence the work immediately on a force account basis and/or issue a lump sum change to the contract price in accordance with the County's estimate of cost. If the change is issued based on the County estimate, the Contractor will waive his right to dispute the action unless within fifteen (15) calendar days following completion of the added/deleted work, the Contractor presents proof that the County's estimate was in error.

19.1.5 If the County disagrees with the proposal submitted by Contractor, it will notify the Contractor in writing and the Contractor may elect to proceed under the DISPUTE article of this Contract, or, in the event either party contests the price or time extension of Change work, or time is of the essence, the County may issue a Construction Change Directive and the contractor shall proceed with the work. The County will provide its opinion of the appropriate price and/or time extension in a "Response to Change Order Request." If the contractor agrees with the County's estimate, a change order will be issued by the County. If no agreement can be reached, the County shall have the right to issue the Change Order Directive setting forth its unilateral determination of the reasonable additions or savings in costs and time attributable to the extra or deleted work.

Such determination shall become final and binding if the Contractor fails to submit a Claim in writing to the County, within twenty-one (21) days of the Change Order Directive, disputing the terms of such Directive. No dispute, disagreement or failure of the parties to reach agreement regarding the amount, if any, of any adjustment to the contract sum or contract time shall relieve the Contractor from the obligation to proceed with performance of the work, including extra work, promptly and expeditiously."

19.1.6 The Contractor will give notice of a requested change on his letterhead within seven (7) calendar days of discovery and, if the County agrees, a proposed change order will be issued on the County's standard change order form.

19.1.7 If any change involves an increase or decrease in the cost of the Contractor's work, a change order shall state the amount to be added or deducted from the Contract amount, and the additional time, if any, needed for the performance of such work.

19.1.8 Any changes to the Contract amount shall be in a lump sum mutually agreed to by the Contractor and the County, except that when, in the opinion of the County, such basis is not feasible the change to the Contract amount shall be determined upon a cost-plus-percentage basis with a guaranteed maximum lump sum cost within the limitations provided by law.

19.1.9 Each lump sum quotation from the Contractor shall be accompanied by sufficiently detailed estimates to permit verification of totals in accordance with (a) through (d) in 19.1.11 below.

19.1.10 When the work is to be done on a cost-plus-percentage basis, the Contractor shall submit statements as required by the County showing all labor, material, and equipment costs incurred, and upon completion of the work, a summary of costs, including overhead and profit, and in accordance with Item (a) through (d) in 19.1.11 below.

19.1.11 Estimates for lump sum quotations and accounting for cost-plus-percentage work shall be limited to direct expenditures necessitated specifically by the subject extra work, and shall be segregated as follows:

a. Labor. The costs of labor will be the actual cost for wages prevailing locally for each craft or type of worker at the time the extra work is done, plus employer payments of payroll taxes and insurance, health and welfare, pension, vacation, apprenticeship funds, and other direct costs resulting from Federal, State or local laws, as well as assessment or benefits required by lawful collective bargaining agreements. The use of a labor classification which would increase the extra work cost will not be permitted unless the contractor establishes the necessity for such additional costs. Labor costs for equipment operators and helpers shall be reported only when such costs are not included in the invoice for equipment rental.

b. Materials. The cost of materials reported shall be at invoice or lowest current price at which such materials are locally available in the quantities involved, plus sales tax, freight and delivery.

c. Tool and Equipment Use. No payment will be made for the use of tools which have a replacement value of $100 or less. Regardless of ownership, the rates to be used in determining equipment use costs shall not exceed listed rates prevailing locally at equipment rental agencies, or distributors, at the time the work is performed.

d. Overhead, Profit and Other Charges. The mark-up for overhead and profit on work added to the Contract shall be according to the following Schedule.

(1) For work performed by the Contractor's forces the added cost for overhead and profit shall not exceed fifteen (15%) percent of the net cost of the work, equipment, labor and materials.

(2) For work performed by a subcontractor, the added cost for overhead and profit shall not exceed fifteen (15%) percent of the net cost of the work, equipment, labor and materials, to which the Contractor may add five (5) percent of the subcontractor's price of the work.

(3) For work performed by a sub-subcontractor the added cost for overhead and profit shall not exceed fifteen (15 %) percent of the net cost for work, equipment, labor and materials to which sub-contractor and general contractor may each add an additional five (5 %) percent of the total price from the lower tier subcontractor.

(4) "Net Cost" is defined as consisting of costs of labor, materials and equipment use and/or rental only. The costs of applicable insurance and bond premium will be reimbursed to the Contractor and subcontractors at cost only, without mark-up.

(5) The cost of direct supervision, except when provided by working foreman whose time is included above, of change order work when done exclusively, and not in conjunction or at the same time as, other work performed on the job and when approved in advance by the County's authorized representative, including only payroll taxes, insurance, pension and direct costs for the labor of supervision may be charged to the change order. The cost of transportation, use of vehicle and other costs incurred by supervision will not be allowed.

19.1.12 For added or deducted work by subcontractors, the Contractor shall furnish to the County the subcontractor's signed detailed estimate of the cost of labor, material and equipment, including the markup by such subcontractor for overhead and profit. The same requirement shall apply to sub-subcontractors.

19.1.13 For added or deducted work furnished by a vendor or supplier, the Contractor shall furnish to the County a detailed estimate or quotation of the cost to the Contractor for such work, signed by such vendor or supplier.

19.1.14 Any change in the work involving both extras and credits shall show a new total cost, including subcontracts. Allowance for overhead and profit, as specified therein, shall be applied if the net total cost is an extra; overhead and profit allowances shall not be applied if the net total cost is a credit. The estimated cost of deductions shall be based on labor and material prices on the date the Contract was executed.

19.1.15 The Contractor shall identify any adjustment in time of the final completion of the Work as a whole which is directly attributable to the changed work within fifteen (15) calendar days of receipt of the proposed change order. The Contractor's request for a change in time will be supported by a detailed schedule analysis including a schedule indicating the activities which have been affected and the additional time being requested.

a. For a change in time for the Work, the Contractor shall be entitled only to such adjustments where completion of the entire Work (critical path) is delayed due to the performance of the changed work. Failure to request extra time when submitting such estimate shall constitute waiver of the right to subsequently claim adjustment in time for final completion based upon such changed work.

b. If the County and the Contractor fail to arrive at an agreement on the amount of extra cost, credit or time extension for a proposed change, a change order will be processed in the amount believed by the County to be reasonable, and the Contractor shall proceed with the work. If the Contractor believes that the amount or time stipulated in the change order is not reasonable for the work required, he may elect to issue a notification in accordance with the DISPUTES article for review by the County, stating therein the basis for his dispute with such change order.

19.1.16 Any change in the Work shall conform to the original Contract Documents insofar as they may apply without conflict to the conditions involved in the change.

19.1.17 Payment for additional work or extras, if any, shall become due and payable in accordance with the provisions for payment in the Contract.

19.1.18 Contractor shall not reserve a right to assess impact cost, extended job site costs, extended overhead, and/or constructive acceleration at a later date as related to any and all changes. All costs or estimated costs must be supported with full schedule and cost documentation with each proposed change within the prescribed submission times. If a request for a change is denied and the Contractor disputes the denial, the Contractor must supply the aforementioned documentation to support his claim under the DISPUTES article of this Contract. No claims shall be allowed for impact, extended overhead costs, and/or construction acceleration due to the multiplicity of changes and/or clarifications. Any attempt by Contractor to change or modify the change order form (sample included herein) shall void the form, including any letters the Contractor may issue in conjunction therewith.

19.1.19 All alterations, extensions of time, extra and additional work and other changes authorized by these specifications or any part of the Contract may be made without securing consent of the surety or sureties on the contract bonds.

19.2 CHANGE ORDERS AND LABOR RATES GUIDELINES

19.2.1 The following are guidelines for preparing change orders:

a. Labor Rates:

(1) To establish the labor rate for each classification and trade, a breakdown shall be submitted to the County.

(2) Labor rates are based on current prevailing state and federal wages. Only those benefits mandated by law or a valid labor contract are paid by the County.

(3) Payroll taxes shall be paid as mandated by law. Labor related insurances shall be paid according to industry standard average.

(4) No other costs related to labor shall be paid by County.

b. Change Orders:

(1) Change orders shall be prepared in accordance with the project contract.

(2) No insurance costs are paid by County, except for labor insurances specified in this guideline under section 1 titled "LABOR RATES".

(3) Material cost shall be broken down on a separate sheet, and for those jobs designated as time and material shall be supported by valid invoices from suppliers.

(4) Hours for non-productive labor, such as non-working foremen or general foremen, shall be paid only when justified in the opinion of the County, and approved by the County. The total number of nonproductive labor hours shall be limited to a maximum of 15% of the total number of productive labor hours.

(5) Cost of use of special equipment shall be paid when justified in the opinion of the County, and approved by the County. Equipment refers to special equipment that is needed to perform that specific job, and does not include the usual tools customarily required for that trade. Small tools costs are not paid by County.

(6) Material transportation costs are paid by County when justified in the opinion of the County, and approved by the County's authorized representative.

(7) Overhead, profit and fees on subcontracts, are paid according to the contract.

(8) No costs other than those designated above shall be paid by County. The percentages of overhead and fee allowed with change orders have been established to account for any other direct or indirect costs that might be incurred due to the change order.

19.3 AUDIT

19.3.1 The County shall have the right to examine and audit all books, estimates, records, contracts, documents, bid documents, subcontracts, and other data of the Contractor (including computations and projections) related to negotiating, pricing, or performing the modification in order to evaluate the accuracy and completeness of the cost or pricing data at no additional cost to the County.

19.3.2 The Contractor shall make available at its office at all reasonable times the materials described in paragraph 19.3.1 above, for examination, audit, or reproduction, until 4 years after final payment under this Contract.

19.3.3 The Contractor shall insert a clause containing all the provisions of this 19.3, including this paragraph, in all subcontracts over $10,000 under this contract.

ARTICLE 20 PAYMENT

20.1 PROGRESS PAYMENTS

20.1.1 The County shall pay the Contractor the price as provided in this Contract.

20.1.2 The County shall make progress payments monthly as the Work proceeds, on estimates approved by the County. The Contractor shall furnish a breakdown of the total contract price, in a format provided by the County, showing the amount included therein for each principal category of the work, in such detail as requested, to provide a basis for determining progress payments.

20.1.3 Contractor shall submit to the County vouchers, schedule activities, or other satisfactory proof of the value of any work for which he claims payment on such account, and receipts showing that progress payments have been duly made on such contracts, and for materials furnished.

20.1.4 In the preparation of estimates, the County may authorize 75% of the value of material delivered and satisfactorily stored on the site, and preparatory work done to be taken into consideration for major equipment if:

a. Consideration is specifically authorized by this Contract; and

b. The Contractor furnishes certified receipt that it has acquired title and paid invoices for such material and that the material will be used to perform this Contract.

20.1.5 On the 25th of each month the Contractor will submit his request for payment. Prior to that submittal the County will review the requested percentage of completion for each activity. The payment request will be in the format as provided by the County and will refer to the schedule.

20.1.6 Upon receipt of a payment request, the County shall:

a. Review that request as soon as practicable after receipt for the purpose of determining that the payment request is a proper payment request; and

b. Any payment request determined not to be a proper request suitable for payment shall be returned to the Contractor as soon as practicable, but not later than seven (7) calendar days after receipt. The returned request for payment shall be accompanied by a document setting forth in writing the reasons why the payment request is not proper.

20.1.7 Any progress payment which is undisputed and properly submitted and remains unpaid for thirty (30) calendar days after receipt by County shall accrue interest to the Contractor equivalent to the legal rate set forth in subdivision (a) of Section 685.010 of the California Code of Civil Procedure. The number of days available to the County to make a payment without incurring interest pursuant to this section shall be reduced by the number of days by which the County exceeds the seven-day return requirement set forth in 20.1.6 above.

20.1.8 In making these progress payments, there shall be retained five percent (5%) from the amount of each progress payment.

20.1.9 Except as otherwise prohibited by law, the Contractor may elect to receive all payments due under the contract pursuant to this section without any retention, by posting securities in accordance with Public Contract Code Section 22300.

20.1.10 Contractor and each subcontractor shall pay each of its employees engaged in work under this Contract in full (less deductions made mandatory by law) in accordance with California law.

20.1.11 The County may withhold (in excess of retentions) or, on account of subsequently discovered evidence, nullify the whole or a part of any certificate to such extent as may be necessary to protect the County from loss on account of:

a. Defective work not remedied..

b. Claims filed or reasonable evidence indicating probable filing of claims.

c. Failure of the Contractor to make payments properly to subcontractors or for material or labor.

d. Damage to another Contractor.

e. Delays in progress toward completion of the work, with the stipulated amount of liquidated damages being withheld for each day of delay for which no extension is granted.

f. Default of the Contractor in the performance of the terms of the Contract.

20.1.12 Should stop notices be filed with the County, County shall withhold the amount required plus 25% from certificates until such claims shall have been resolved pursuant to applicable law. California Civil Code Section 3179 et seq.

20.1.13 Contractor shall provide (1) forms of conditional releases of stop notice and bond rights upon progress payment, complying with California Civil Code Section 3262(d)(1), for all work performed during the time period covered by the current Application for Payment, signed by the Contractor and the subcontractors of every tier; and (2) forms of unconditional release of stop notice and bond rights upon progress payment, complying with Civil Code Section 3262(d)(2) for all work performed during the time period covered by previous Application for Payment, signed by Contractor and the subcontractors of every tier.

20.1.14 All material and work covered by progress payments made shall, at the time of payment, become the sole property of the County, but this shall not be construed as:

a. An acceptance of any work not in accordance with the Contract Documents; or

b. Waiving the right of the County to require the fulfillment of all of the terms of the contract.

20.2 FINAL PAYMENT

20.2.1 GENERAL

a. The County shall pay the amount due the Contractor under this Contract after:

1.) The Acceptance of all work and Notice of Completion per the terms of this Contract;

2.) Presentation of a properly executed voucher;

3.) Submission of conditional releases and waivers of stop notice and bond rights upon final payment in the form required by California Civil Code Section 3262(d)(3) executed by Contractor and by all the subcontractors of every Tier.

4.) Presentation of release of all claims against the County arising by virtue of this Contract, other than claims and disputes in stated amounts, that the Contractor has specifically excepted from the operation of the release.

b. The Contractor may, if any subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the County, to indemnify him against any lien.

20.2.2 FINAL CERTIFICATE FOR PAYMENT

a. When the work is ready for acceptance by the County, the Economic Development Agency will certify and submit to the Board of Supervisors a Notice of Completion. Upon approval of the Notice of Completion, a copy will be sent to the Contractor.

b. Notice of Completion will be recorded by the County upon completion and Acceptance of the Work. Providing no stop notices have been filed, thirty-five (35) calendar days after filing of such Notice of Completion, payment due under the contract will become due to the Contractor and the County shall so certify authorizing the final payment.

20.2.3 FINAL PAYMENT

a. After Acceptance of Work, the County will submit to Contractor a statement of the sum due Contractor under this contract, together with County payment in the amount thereof. Said statement shall take into account the contract price, as adjusted by any change orders; amounts already paid; sums to be withheld for incomplete work; liquidated damages; and for any other cause under the Contract.

b. The Contractor shall, from the effective date of Acceptance until the expiration of four years after final settlement under this Contract, preserve and make available to the County, all its books, records, documents, and other evidence bearing on the costs and expenses of the Contractor under this Contract.

ARTICLE 21 SUSPENSION OF WORK/TERMINATION

21.1 NON-COMPLIANCE WITH CONTRACT REQUIREMENTS

21.1.1 In the event the Contractor, after receiving written notice from the County of non-compliance with any requirement of this Contract, fails to promptly initiate appropriate action to comply with the specified requirement, the County shall have the right to withhold payment for work completed under the Contract until the Contractor has complied with the notice or has initiated such action as may be appropriate to comply, within a reasonable period of time. The Contractor shall not be entitled to any extension of contract time or payment for any costs incurred for work under this article.

21.1.2 Should the Contractor abandon the Work called for under the Contract, or assign his Contract, or unnecessarily and unreasonably delay the work, or willfully violate or perform the work in bad faith, the County shall have the power to notify the Contractor to discontinue all work or any part thereof under this Contract, and thereupon the Contractor shall cease to continue said work or such part thereof as the County may designate, and the County shall have the power to employ such persons as it may consider desirable, and to obtain by contract, purchase, hire or otherwise, such implements, tools, material or materials as the County may deem advisable to work at and be used to complete the work herein described, or such part thereof as shall have not been completed, and to use such material as it may find upon the site of the work, and to charge the expense of such labor and material, implements and tools to the Contractor, and the expense so charged shall be deducted and paid by the County out of such monies as may either be due, or may at any time thereafter become due to the Contractor under the Contract.

21.2 TERMINATION

21.2.1 TERMINATION FOR BREACH

If the Contractor should be adjudged bankrupt or if he should make a general assignment for the benefit of his

creditors, or if a receiver should be appointed on account of his insolvency, or if he or any of his subcontractors should violate any of the provisions of the Contract, the County may serve written notice upon him and his surety of its intention to terminate Contractor's performance hereunder, said notice shall contain the reasons for such intention to terminate Contractor's performance, and, unless within ten (10) calendar days after serving of said notice, such violation shall cease and satisfactory arrangements for correction thereof be made, Contractor's performance shall, upon the expiration of said ten (10) calendar days, cease and terminate. In the event of any such termination, the County shall immediately serve written notice thereof upon the surety and the Contractor, and the County may take over the Contractor's work and prosecute the same to completion by contract or by any other method it may deem advisable, for the account and at the expense of the Contractor, and the Contractor and his surety shall be liable to the County for any excess cost occasioned the County thereby, and in such event the County may without liability for so doing take possession of and utilize in completing the work, such materials, appliances, plants, and other property belonging to the Contractor as may be on the site of the work and necessary therefore.

21.2.2 TERMINATION FOR CONVENIENCE

a. If the construction of the project herein is damaged, which damage is determined to have been proximately caused by an Act of God, in excess of 5% of the contract amount, provided that the work damaged is built in accordance with applicable building standards and the plans and specifications, then the County may, without prejudice to any other right or remedy, terminate the Contract.

b. The County may terminate performance of work under this Contract in whole or in part, if the County determines that a termination is in the County's interest. The County shall terminate by delivering to the Contractor a Notice to Terminate specifying the extent of termination and the effective date.

c. After receipt of such Notice, and except as directed by the County, the Contractor shall immediately proceed with the following obligations, regardless of any delay in determining or adjusting any amounts due under this clause:

(1) Stop work as specified in the notice.

(2) Place no further subcontracts or orders (referred to as subcontracts in this clause) for materials, services, or facilities, except as necessary to complete any continued portion of the Contract.

(3) To terminate all subcontracts to the extent they relate to the work terminated.

(4) With approval or ratification to the extent required by the County, settle all outstanding liabilities and termination settlement proposals arising from termination of subcontracts; the approval or ratification will be final for purposes of this clause.

(5) As directed by the County, transfer title and deliver to the County (1) the fabricated or unfabricated parts; work in progress, completed work, supplies, and other material produced or acquired for the work terminated; and (2) 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 County.

(6) Complete performance of work not terminated.

(7) Take any action that may be necessary, or that the County may direct, for the protection and preservation of the property related to this contract that is in the possession of the Contractor and in which the County has or may acquire an interest.

(8) Use its best efforts to sell, as directed or authorized by the County, any property of the types referred to in subparagraphs above; provided, however, that the Contractor (1) is not required to extend credit to any purchaser and (2) may acquire the property under the conditions prescribed by, and at prices approved by the County. The proceeds of any transfer or disposition will be applied to reduce any payments to be made by the County under this contract, credited to the price or cost of the work, or paid in any other manner directed by the County.

d. After termination, the Contractor shall submit a final termination settlement proposal to the County in the form and with the certification prescribed by the County. The Contractor shall submit the proposal promptly, but no later than thirty (30) days from the effective date of termination. If the Contractor fails to submit the proposal within the time allowed, the County may determine, on the basis of information available, the amount, if any, due the Contractor because of the termination and shall pay the amount determined.

e. Subject to subparagraph (2) above, the Contractor and the County may agree upon the whole or any part of the amount to be paid because of the termination. The amount may include a reasonable allowance for profit on work done. However, the agreed amount, may not exceed the total contract price as reduced by:

(1) the amount of payments previously made and;

(2) the contract price of work not terminated. The contract shall be amended with a Change Order, and the Contractor paid the agreed amount.

f. If the Contractor and County fail to agree on the whole amount to be paid the Contractor because of the termination of work, the County shall pay the Contractor the amounts determined as follows:

(1) For contract work performed before the effective date of termination, the total (without duplication of any terms) of:

(i) The cost of this work;

(ii) The cost of settling and paying termination settlement proposals under terminated subcontracts that are properly chargeable to the terminated portion of the contract if not included in subdivision (i) above; and

(iii) A sum, as profit on (i) above, determined by the County to be fair and reasonable; however, if it appears that the Contractor would have sustained a loss on the entire contract had it been completed, the County shall allow no profit under this subdivision (iii).

(2) The reasonable costs of settlement of the work terminated including:

(i) Accounting, clerical, and other expenses reasonably necessary for the preparation of termination settlement proposals and supporting data; and

(ii) Storage, transportation, and other costs incurred, reasonably necessary for the preservation, protection, or disposition of the termination inventory.

g. Except for normal spoilage, the County shall exclude from the amounts payable to the Contractor the fair value, as determined by the County, of defective work, and of property that is destroyed, lost, stolen, or damaged so as to become undeliverable.

h. The Contractor shall have the right to make a claim under the DISPUTES article, from any determination made by the County.

i. In arriving at the amount due the Contractor, there shall be deducted:

(1) All unliquidated advance or other payments to the Contractor under the terminated portion of this Contract;

(2) Any claim which the County has against the Contractor under this Contract; and

(3) The agreed price for, or the proceeds of sale of, materials, supplies, or other things acquired by the Contractor or sold under the provisions of this clause and not recovered by or credited to the County.

j. If the termination is partial, the Contractor may file a proposal with the County for a Change Order of the price(s) of the continued portion of the Contract. The County shall process any Change Order agreed upon. Any proposal by the Contractor for an equitable adjustment under this clause shall be requested within thirty (30) days from the effective date of termination unless extended in writing by the County.

k. The County may, under the terms and conditions it prescribes, make partial payments and payments against costs incurred by the Contractor for the terminated portion of the Contract, if the County believes the total of these payments will not exceed the amount to which the Contractor will be entitled. If the total payments exceed the amount finally determined to be due, the Contractor shall repay the excess to the County upon demand, together with interest.

l. Unless otherwise provided in this Contract or by statute, the Contractor will maintain all records and documents relating to the terminated portion of this Contract for 4 years after final settlement. This includes all books and other evidence bearing on the Contractor's costs and expenses under this Contract. The Contractor shall make these records and documents available to the County, State and/or the U.S. Government or their representatives at all reasonable times, without any direct charge.

ARTICLE 22 DISPUTES/CLAIMS

22.1 CLAIMS RESOLUTION

In accordance with Public Contract Code Sections 20104 20104.6 and other applicable law, public works claims of $375,000 or less which arise between the Contractor and the Owner shall be resolved under the

following the statutory procedure unless the Owner has elected to resolve the dispute pursuant to Public Contract Code Section 10240 et seq.

a. All claims shall be submitted in writing and accompanied by substantiating documentation. Claims must be filed on or before the date of final payment unless other notice requirements are provided in the contract. "Claim" means a separate demand by the claimant for (1) a time extension, (2) payment of money or damages arising from work done by or on behalf of the claimant and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled, or (3) an amount the payment of which is disputed by the Owner.

b. Claims Under $50,000. The Owner shall respond in writing to the claim within 45 days of receipt of the claim, or, the Owner may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses or claims the Owner may have. Of additional information is needed thereafter, it shall be provided upon mutual agreement of the Owner and the claimant. The Owner's written response shall be submitted 15 days after receiving the additional documentation, or within the same period of time taken by the claimant to produce the additional information, whichever is greater.

c. Claims over $50,000 but less than or equal to $375,000. The Owner shall respond in writing within 60 days of receipt, or, may request in writing within 30 days of receipt of the claim, any additional documents supporting the claim or relating to defenses or claims the Owner may have against the claimant. If additional information is needed thereafter, it shall be provided pursuant to mutual agreement between the Owner and the claimant. The Owner's response shall be submitted within 30 days after receipt of the further documents, or within the same period of time taken by the claimant to produce the additional information or documents, whichever is greater. The Contractor shall make these records and documents available to the County, State and/or the U.S. Government or their representatives at all reasonable times, without any direct charge.

d. If the claimant disputes the Owner's response, or if the Owner fails to respond within the statutory time period(s), the claimant may so notify the Owner within 15 days of the receipt of the response or the failure to respond, and demand an informal conference to meet and confer for settlement. Upon such demand, the Owner shall schedule a meet and confer conference within 30 days.

e. If following the meet and confer conference, the claim or any portion thereof remains in dispute, the claimant may file a claim pursuant to Government Code 900 et seq. and Government Code 910 et seq. For purposes of those provisions, the time within which a claim must be filed shall be tolled from the time the claimant submits the written claim until the time the claim is denied, including any time utilized for the meet and confer conference.

f. If a civil action is filed to resolve any claim, the provisions of Public Contract Code 20104.4 shall be followed, providing for nonbinding mediation and judicial arbitration.

22.2 CLAIM FORMAT/REQUIREMENTS

22.2.1 The Contractor will submit the claim justification in the following format:

a. Summary of claim merit and price plus clause under which the claim is made.

b. List of documents relating to claim

(a) Specifications
(b) Drawings
(c) Clarifications (RFIS)
(d) Schedules
(e) Other

c. Chronology of events and correspondence

d. Analysis of claim merit

e. Analysis of claim cost

f. Analysis of Time in CPM format

g. Cover letter and certification (form included herein)

22.2.2 If any claim submitted includes a request for overhead, the County may request a Profit & Loss statement and supporting documentation from Contractor. If requested, such documentation must be submitted for the County to consider the claim.

22.2.3 Submission of a claim, properly certified, with all required supporting documentation, and written rejection or denial of all or part of the claim by County, is a condition precedent to any action, proceeding, litigation, suit, general conditions claim, or demand for arbitration by Contractor.

22.3 NOTICE OF THIRD PARTY CLAIMS

The County shall provide notification to the Contractor within a reasonable time after receipt of any third-party claim relating to the Construction Contract.

SECTION 01 30 00

SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section includes admininstrative and procedural requirements for submittals required for performance of the Work, including the following:
   1. Contractor's Construction Schedule.
   2. Shop Drawings.
   3. Product Data.
   4. Samples.
   5. Daily Construction Reports.

B. Administrative Submittals: Refer to other Division 1 Sections and other Contract Documents for requirements for Administrative Submittals. Such submittals include, but are not limited to, the following:
   1. Permits.
   2. Applications for Payment.
   3. Performance and Payment Bonds.
   4. Insurance Certificates.
   5. List of Subcontractors.

C. Related Sections: The following sections contain requirements that relate to this section:
   1. Section 01 31 00 - "Coordination" specifies requirements governing preparation and submittal of required coordination drawings.
   2. Section 01 45 00 - "Quality Control" specifies requirements for submittal of inspection and test reports.

1.02 DEFINITIONS

A. Coordination Drawings show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or to function as intended.
   1. Preparation of coordination drawings is specified in Section 01 31 00 - "Coordination" and may include components previously shown in detail on Shop Drawings or Product Data.

B. Field Samples are full-size physical examples erected on-site to illustrate finishes, coatings, or finish materials. Field samples are used to establish the standard by which the work will judged.

C. Mockups are full-size assemblies for review of construction, coordination, testing or operation; they are not Samples.

1.03 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

1. Processing: To avoid the need to delay installation as a result of the time required to process submittals, allow sufficient time for submittal review, including time for resubmittals.
   a. Allow two (2) weeks for initial review. Allow additional time if the Architect must delay processing to permit coordination with subsequent submittals.
   b. If an intermediate submittal is necessary, process the same as the initial submittal.
   c. Allow two (2) weeks for reprocessing each submittal.
   d. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the work to permit processing.

B. Submittal Transmittal: Package each submittal appropriately for handling. Transmit each submittal from the Contractor to the Architect using a transmittal form, including Job Name, Specification Section Number and Required Lead-Time. The Architect will not accept submittals received from sources other than the Contractor.

1.04 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Submit five (5) copies of the Construction Schedule, broken down by trade or material, to the Architect for approval prior to the first Application for Payment. Schedule shall be by CPM or bar graph type, and shall show proposed starting and completion dates for each trade and activity for the work. Submit five (5) copies of the updated schedule at each Application for Payment review to the Architect.
   1. Within each time bar, indicate estimated completion percentage in 10 percent increments. As work progresses, place a contrasting mark in each bar to indicate Actual Completion.

B. Submit completed Construction Schedule to Architect no later than 20 calendar days after the date established for "Notice to Proceed", and update monthly during construction. Submit current schedule with each Application for Payment.

C. Distribution: Following response to the initial submittal, print and distribute copies to the Architect, Owner, Subcontractors and other parties required to comply with scheduled dates. Post copies in the Project Meeting Room and temporary field office.

D. Submit completed material delivery schedule to the Architect no later than 20 calendar days after the "Notice to Proceed". Identify material critical to the progress of the Project and those for which long lead-time in procurement is anticipated. Indicate projected dates for submittal, order and delivery of such material.

1.05 SHOP DRAWING SUBMITTAL SCHEDULE

A. After development and acceptance of the Contractor's Construction Schedule, prepare a complete Schedule of Submittals. Submit the Schedule within 10 days of the date required for submittal of the Contractor's Construction Schedule.

1.06 SHOP DRAWINGS (SUBMITTALS)

A. Submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings.

Standard information prepared without specific reference to the Project is not a Shop Drawing.

B. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:
   1. Job Name.
   2. Location.
   3. Dimensions.
   4. Notation of dimensions established by field measurements.
   5. If Shop Drawings are rejected twice by the Architect and a third submittal is required, the Trade Contractor will be billed $150/hour for review time.

1.07 PRODUCT DATA

A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information, such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, and performance curves.

B. A copy of manufacturer's installation instructions and warranty literature shall be provided for all products at time of Shop Drawing submittal. However, this submission shall not relieve the Contractor's duty to assemble warranty manuals and installation literature at the end of the project. Refer to Section 01 77 00 - "Closeout Procedures".

1.08 SAMPLES

A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture and pattern.
   1. Submit samples for review of size, kind, finish, color, pattern and texture. Submit samples for a final check of these characteristics with other elements and a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
      a. Where vatiation in color, pattern, texture or other characteristic is inherent in the material or product represented, submit at least three (3) multiple units that show approximate limits of the variations.
   2. Maintain sets of Samples, as returned, at the project site, for quality comparisons throughout the course of construction.

1.09 ARCHITECT'S ACTION

A. Except for submittals for the record or information, where action and return is required, the Architect will review each submittal, mark to indicate action taken, and return.
   1. Compliance with specified characteristics is the Contractor's responsibility.

B. Action Stamp: The Architect will stamp each submittal with a uniform, action stamp. The Architect will review each submittal, mark to indicate action taken, and return.

1. Final Unrestricted Release: When the Architect marks a submittal "No Exception Taken", the work covered by the submittal may proceed provided it complies with requirements of the Contract Documents.
2. Final-but-Restricted Release: When the Architect marks a submittal "Make Corrections Noted", the work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents.
3. Returned for Resubmittal: When the Architect marks a submittal "Rejected", "Revise and Resubmit" do not proceed with work covered by the submittal, including purchasing, fabrication, delivery or other activity. Revise or prepare a new submittal according to the notations; resubmit without delay. Repeat if necessary to obtain different action mark.
   a. Do not use, or allow others to use, submittals marked "Rejected", "Revise and Resubmit" at the project site or elsewhere where work is in progress.

C. Unsolicited Submittals: The Architect will return unsolicited submittals to the sender without action.

1.10 DAILY CONSTRUCTION REPORTS

A. Prepare a Daily Construction Report recording the following information concerning events at the site, and submit duplicate copies to the Owner and Architect at two-week intervals.
   1. List of Subcontractors at the site.
   2. Approximate count of personnel at the site.
   3. High and low temperatures, general weather conditions.
   4. Accidents and unusual events.
   5. Meetings and significant decisions.
   6. Stoppages, delays, shortages and losses.
   7. Emergency procedures.
   8. Orders and requests of governing authorities.
   9. Services connected, disconnected.
   10. Equipment or system tests and startups.

PART 2 PRODUCTS

-- NOT APPLICABLE --

PART 3 EXECUTION

-- NOT APPLICABLE --

END OF SECTION 01 30 00

SECTION 01 31 00

COORDINATIION

PART 1 GENERAL

1.01 GENERAL COORDINATION PROVISIONS

A. Carefuly study and compare Contract Documents before proceeding with fabrication and installation of work. Promptly advise Architect of any error, inconsistency, omission or apparent discrepancy discovered.

B. Allot time in construction scheduling for liason with Architect; establish procedures for handling queries and clarifications. Use "Request for Information " (RFI) form for requesting information.

C. If Architect is able to respond to a Request for Information (RFI), by making specific reference to Drawing sheet of Specification section, Contractor shall reimburse Owner for charges of Architect and Architect's Consultants for performing review services for the Contractor.

D. Coordinate work of various specification sections having interdependent responsibilities for installation, connection and operation.

1.02 SUMMARY

A. This section includes administrative and supervisory requirements necessary for coordinating construction operations including, but not necessarily limited to, the following:
   1. General project coordination procedures.
   2. Administrative and supervisory personnel
   3. Cleaning and protection.

B. Related Sections: The following sections contain requirements that relate to this section:
   1. Section 01 30 00 - "Submittals" for preparing and submitting the Project Manager's Construction Schedule.
   2. Section 01 77 00 - "Closeout Procedures" for coordinating contract closeout.

1.03 COORDINATION DRAWINGS AND LAYOUTS

A. General:
   1. Coordination Drawings are not Shop Drawings and are not to be submitted to Architect for approval.
   2. Coordination drawings show relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in space provided or to function as intended.

B. Coordinate in field with affected trades for proper relationship to work based on project conditions.

C. Notify Architect of conflicts and other coordination issues requiring resolution prior to commencing construction in each affected area.

D. Make coordination documents available in field office for review by Architect and Owner during entire period of construction.

1.04 COORDINATION

A. Coordinate construction operations included in various sections of these specifications to assure efficient and orderly installation of each part of the work.
   1. Schedule construction operations in the sequence required to obtain the best results where installation of one part of the work depends on installation of other components, before or after its own installation.
   2. Coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
   3. Make provisions to accommodate items scheduled for later installation.

B. The Contractor shall review the entire construction document set for dimensional coordination. Special attention should be placed on architectural/structural dimension coordination.
   1. If discrepancies occur, the Contractor is directed to place a written request to the Project Architect for clarification. This request must occur prior to any work occurring.
   2. Proceeding into an area of work without checking the documents for dimensional coordination and resolving the condition in a timely manner will in no way release the Contractor from correction procedures.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and assure orderly progress of the work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of schedules.
   2. Installation and removal of temporary facilities.
   3. Delivery and processing of submittals.
   4. Progress meetings.
   5. Project closeout activities.

PART 2 PRODUCTS

-- NOT APPLICABLE --

PART 3 EXECUTION

3.01 GENERAL COORDINATION PROVISIONS

A. Inspection of Conditions: Require the installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

B. Coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.

3.02 CLEANING AND PROTECTION

A. Clean and protect construction in progress and adjoining materials in place, during handling and installation. Apply protective covering where required to assure protection from damage or deterioration at Substantial Completion.

B. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to assure operability without damaging effects.

C. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:
   1. Excessively high or low temperatures.
   2. Excessively high or low humidity.
   3. Air contamination or pollution.
   4. Water or ice.
   5. Solvents.
   6. Chemicals.
   7. Light.
   8. Radiation.
   9. Puncture.
   10. Heavy traffic.
   11. Soiling, staining and corrosion.
   12. Combustion.
   13. Electrical current.
   14. Improper lubrication.
   15. Unusual wear or other misuse.
   16. Contact between incompatible materials.
   17. Misalignment.
   18. Excessive weathering.
   19. Unprotected storage.
   20. Improper shipping or handling.
   21. Theft.
   22. Vandalism.

END OF SECTION 01 31 00

SECTION 01 42 00

REFERENCE STANDARDS AND DEFINITIONS

PART 1 GENERAL

1.01 REFERENCES

A. The Contract Documents contain references to various standard specifications, codes, practices and requirements for materials, work quality, installation, inspections and tests, which references are published and issued by the organizations listed hereinafter by abbreviation and name. Such references are hereby made a part of these Contract Documents to the extent indicated or required.

1.02 DEFINITIONS

A. General: Basic contract definitions are included in the General and Special Conditions of the Contract.

B. "Indicated": The term "indicated" refers to graphic representations, notes or schedules on the Drawings; or to other paragraphs or schedules in the Specifications and similar requirements in the Contract Documents. Terms such as "shown", "noted", "scheduled" and "specified" are used to help the user locate the reference. Location is not limited.

C. "Directed": Terms such as "directed", "requested", "authorized", "selected", "approved", "required" and "permitted" mean directed by the Architect, requested by the Architect, and similar phrases.

D. "Approved": The term "approved", when used in conjunction with the Architect's action on the Contractor's submittals, applications and requests, is limited to the Architect's duties and responsibilities as stated in the General and Supplementary Conditions of the Contract.

E. "Regulations": The term "regulations" includes laws, ordinances, statutes and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": The term "furnish" means to supply and deliver to the project site, ready for unloading, unpacking, assembly, installation and similar operations.

G. "Install": The term "install" describes operations at the project site including the actual unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations.

H. "Provide": The term "provide" means to furnish and install, complete and ready for the intended use.

I. "Installer": An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor or contractor of lower tier, who performs a particular construction activity including installation, erection, application, or similar opertions. Installers are required to be experienced in the operations they are engaged to perform.

1. The term "experienced", when used with the term "installer", means having successfully completed a minimum of 5 previous projects similar in size and scope to this project, being familiar with the specfied requirements indicated; and having complied with requirements of authorities having jurisdiction.
2. Trades: Using terms such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter". It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.
3. Assigning Specialists: Certain sections of the Specifications require that specific construction activties shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling contract requirements remains with the Contractor.
    a. This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the work. It is also not intended to interfere with local trade-union jurisdictional settlements and similar conventions.

J. "Project Site" is the spce available to the Contractor for performing construction activities, either exclusively or in conjunction with others performing work as part of the Project. The extent of the project site is shown on the drawings and may or may not be identical with the description of the land on which the Project is to be built.

K. "Testing Agencies": A testing agency is an independent entity engaged to perform specific inspections or tests, either at the project site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.03 SPECIFICATION FORMAT AND CONTENT EXPLANATION

A. Specification Format: These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 2004 "Masterformat" numbering system.

B. Specification Content: These Specifications use certain conventions for the style of language and the intended meaning of certain terms, words and phrases when used in particular situations. These conventions are as follows:
    1. Abbreviated Language: Language used in Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate words implied, but not stated, shall be interpolated as the sense requires. Singular words shall be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.
    2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.

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

1.04 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such Standards are made a part of the Contract Documents by reference.

B. When the effective date of a Reference Standard is not given, it shall be understood that the current edition or latest revision thereof and any amendments or supplements thereto in effect on the date of issue of these Contact Documents, as indicated by the date on the cover sheet or in the Invitation to Bid, shall govern the work.

C. Conflicting Requirements: Where compliance with 2 or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different but apparently equal to the Architect for a decision before proceeding.
   1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to the Architect for a decision before proceeding.

D. Copies of Standards: Each entity engaged in construction on the Project must be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
   1. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source and make them available on request.

E. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. The following list of general reference standards is common to the construction industry. This list is not all-inclusive nor does the presence of a reference standard imply necessarily that it is referenced in the Specifications or other Contract Documents.

AA	Aluminum Association
AABC	Associated Air Balance Council
AAMA	American Architectural Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials

ACI	American Concrete Institute International
ADC	American Diffusion Council
AGA	American Gas Association
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ALSC	American Lumber Standards Committee
AMCA	Air Movement and Control Association International
ANSI	American National Standards Institute
APA	Engineered Wood Association (Formerly American Plywood Ass'n)
ARI	Air Conditioning and Refrigeration Institute
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engrs
ASME	The American Society of Mechanical Engineers
ASPE	American Society of Plumbing Engineers
ASSE	The American Society of Sanitary Engineers
ASTM	American Society for Testing and Materials
AWI	Architectural Woodwork Institute
AWS	American Welding Society
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Industry Association
CISCA	Ceilings & Interior Systems Construction Association
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute
CRSI	Concrete Reinforcing Steel Institute
DHI	Door and Hardware Institute (Formerly Ntl. Builders Hardware Assoc)
EIMA	EIFS Industry Manufacturers Association
FGMA	Flat Glass Marketing Association
FM	Factory Mutual Research Corporation
GA	Gypsum Association
GANA	Glass Association of North America
IAPMO	International Association of Plumbing and Mechanical Officials

ICBO	International Conference of Building Officials
ICC	International Code Council
IEEE	Institute of Electrical and Electronics Engineers
IESNA	Illuminating Engineering Society of North America
IGCC	Insulating Glass Certification Council
MBMA	Metal Building Manufacturers Association
NAAMM	The National Association of Architectural Metal Manufacturers
NCMA	National Concrete Masonry Association
NEBB	National Environmental Balancing Bureau
NECA	National Electrical Contractors Association
NEMA	National Electrical Manufacturers Association
NETA	National Electrical Contractors Association
NFPA	National Fire Protection Association
NRCA	National Roofing Contractors Association
NSF	NSF International (National Sanitation Foundation)
PCA	Portland Cement Association
PDI	Plumbing and Drainage Institute
SDI	Steel Door Institute
SGCC	Safety Glazing Certification Council
SJI	Steel Joist Institute
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
TCA	Tile Council of America
UBC	Uniform Building Code (International Conference of Building Officials)
UL	Underwriters Laboratories, Inc.
WCLIB	West Coast Lumber Inspection Bureau
WDMA	Window and Door Manufacturers Association (Formerly NWWDA)
WIC	Woodwork Institute of California

F. Federal Government Agencies and Acronyms: Names and titles of Federal Government standards - or specification-producing agencies are often abbreviated. The following abbreviations and acronyms which may be referenced in the Contract Documents indicate names of standards - or specification-producing agencies of the Federal Government. This list is not all-inclusive nor does presence on the list imply necessarily that the abbreviation is referenced in the Specifications or other Contract Documents.

ADA	Americans with Disabilities Act
CFR	Code of Federal Regulations
COE	Corps of Engineers, U S Army
CPSC	Consumer Product Safety Commission
DOC	Department of Commerce
DOT	Department of Transportation
EPA	Environmental Protection Agency
FAA	Federal Aviation Adiministration
FCC	Federal Communications Commission
FDA	Food and Drug Administration
FHA	Federal Housing Administration
FS	Federal Specifications and Standards (General Services Admin)
GSA	General Services Administration
MIL	Military Specifications and Standards (U S Dept of Defense)
NIST	National Institute of Standards and Technology
OSHA	Occupational Safety and Health Administration (U S Dept ofLabor)
PS	Product Standards (U S Dept of Commerce)
USDA	United States Department of Agriculture
USPS	United States Postal Service

PART 2 PRODUCTS

-- NOT APPLICABLE --

PART 3 EXECUTION

-- NOT APPLICABLE --

END OF SECTION 01 42 00

SECTION 01 45 00

QUALITY CONTROL

PART 1 GENERAL

1.01 SUMMARY

A. This section includes administrative and procedural requirements for quality-control services.

B. Quality-Control services include inspections, tests and related actions, including reports performed and/or directed by the Contractor, by independent agencies, and by governing authorities. They do not include contract enforcement activities performed by Architect.

C. Inspection and testing services are required to verify compliance with requirements specified or indicated in the Construction Documents. These services do not relieve Contractor of responsibility for compliance with Contract Document requirements.

1.02 RESPONSIBILITIES

A. Owner will employ and pay for services of an Independent Testing Laboratory to perform specified inspections and testing.

B. Contractor Responsibilities:
   1. Deliver to laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs.
   2. Cooperate with laboratory personnel, and provide access to the work, and to manufacturer's facilities.
   3. Provide incidental labor and facilities to provide access to work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.
   4. Notify Architect/Engineer and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.
      a. Unless otherwise indicated as the responsibility of another identified entity, Contractor shall provide inspections, tests and other quality-control services specified elsewhere in the Contract Documents and required by authorities having jurisdiction. Costs for these services are included in the Contract Sum.
         1) Where individual sections specifically indicate that certain inspections, tests, and other quality-control services are the Contractor's responsibility, the Contractor shall employ and pay a qualified independent testing agency to perform quality-control services. Costs for these services are included in the Contract Sum.

C. Retesting: The Contractor is responsible for retesting where results of inspections, tests or other quality-control services prove unsatisfactory and indicate noncompliance with Contract Document requirements.

1. The cost of retesting construction, revised or replaced by the Contractor or Trade Subcontractor, is the Trade Subcontractor's responsibility where required tests performed on original construction indicated noncompliance with Contract Document requirements.
2. Associated Services: Cooperate with agencies performing required inspections, tests and similar services, and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include, but are not limited to, the following:
   a. Provide security and protection of samples and test equipment a the project site.

D. Duties of the Testing Agency: The Independent Agency engaged to perform inspections, sampling and testing of materials and construction specified in individual sections shall cooperate with the Architect and the Contractor in performance of the agency's duties. The testing agency shall provide qualified personnel to perform required inspections and tests.
   1. The agency shall notify the Architect and the Contractor promptly of irregularities or deficiencies observed in the work during performance of its services.
   2. The agency is not authorized to release, revoke, alter or enlarge requirements of the Contract Documents or approve or accept any portion of the work.

E. Coordination: Coordinate the sequence of activities to accommodate required services with a minimum of delay. Coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.
   1. The Contractor is responsible for scheduling times for inspections, tests, taking samples, and similar activities.

1.03 SUBMITTALS

A. The Independent Testing Agency shall submit a certified written report, in duplicate, of each inspection, test or similar service to the Architect and Structural Engineer. If the Contractor is responsible for the service, submit a certified written report, in duplicate, of each inspection, test, or similar service through the Contractor.
   1. Submit additional copies of each written report directly to the governing authority, when the authority so directs.
   2. Report Data: Written reports of each inspection, test or similar service include, but are not limited to, the following:
      a. Date of issue.
      b. Project title and number.
      c. Name, address and telephone number of testing agency.
      d. Dates and locations of samples and tests or inspections.
      e. Names of individuals making the inspection or test.
      f. Designation of the work and test method.
      g. Identification of product and Specification Section.
      h. Complete inspection or test data.
      i. Test results and an interpretation of test results.
      j. Ambient conditions at the time of sample taking and testing.

k. Comments or professional opinion on whether inspected or tested work complies with Contract Document requirements.
l. Name and signature of laboratory inspector.
m. Recommendations on retesting.

1.04 REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referrred to a Reference Standards, comply with requirements of the Standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to Reference Standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of Standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning and progress of the specific work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

F. Neither the contractural relationships, duties or responsibilities of the parties in contract nor those of Architect shall be altered from the Contract Documents by mention or inference in any reference document.

1.05 QUALITY ASSURANCE

A. Qualifications of Service Agencies: Engage inspection and testing service agencies, including independent testing laboratories, that are prequalified as complying with the American Council of Independet Laboratories' "Recommended Requirements for Independet Laboratory Qualification" and that specialize in the types of inspections and tests to be performed.
1. Each Independent Inspection and Testing Agency engaged on the project shall be authorized by authorities having jurisdiction to operate in the state where the project is located.

PART 2 PRODUCTS

-- NOT APPLICABLE --

PART 3 EXECUTION

3.01 REPAIR AND PROTECTION

A. General: Upon completion of inspection, testing, sample taking and similar services, repair damaged construction and restore substrates and finishes. Comply with Contract Document requirements for Section 01 70 00 - "Execution Requirements".

B. Protect construction exposed by or for quality-control service activities, and protect repaired construction.

C. Repair and protection is Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

D. Should manufacturer's instructions conflict with Contract Documents, request clarification from Architect before proceeding.

E. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes or specified requirements indicate higher standards or more precise workmanship.

F. Have work performed by persons qualified to produce required and specified quality.

G. Verify that field measurements are as indicated on Shop Drawings or and instructed by the manufacturer.

H. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion and disfigurement.

3.02 MANUFACTURER'S FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as appicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

END OF SECTION 01 45 00

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Products

B. Transportation and handling.

C. Storage and protection.

D. Product options.

E. Substitutions.

1.02 SUBMITTALS

A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

D. Indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

1.03 PRODUCTS

A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse

B. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.

C. Provide interchangeable components of the same manufacturer, for similar components.

1.04 TRANSPORTATION AND HANDLING

A. Transport and handle Products in accordance with manufacturer's instructions

B. Promptly inspect shipments to assure that Products comply with requirements, quantities are correct, and Products are undamaged.

C. Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.05 STORAGE AND PROTECTION

A. Store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.

B. For exterior storage of fabricated products, place on sloped supports, above ground.

C. Provide off-site storage and protection when site does not permit on-site storage or protection.

D. Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.

E. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

F. Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.

G. Arrange storage of Products to permit access for inspection. Periodically inspect to assure Products are undamaged and are maintained under specified conditions

1.06 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

C. Products specified by naming only one Manufacturer is intended to establish the standard required. It is not intended to limit the selection of equal products of other manufacturers.

1.07 SUBSTITUTIONS

A. Architect/Engineer will consider requests for Substitutions only within 30 days after date of Owner Contractor Agreement.

B. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.

C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

D. A request constitutes a representation that the Contractor:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Will provide the same warranty for the Substitution as for the specified product.
   3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner

4. Waives claims for additional costs or time extension which may subsequently become apparent.

E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

F. Substitution Submittal Procedure:
   1. Submit six copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
   2. Submit shop drawings, Product data, and certified test results attesting to the proposed product equivalence.
   3. The Architect/Engineer will notify Contractor, in writing, of decision to accept or reject request.

PART 2 PRODUCTS

-- NOT APPLICABLE --

PART 3 EXECUTION

-- NOT APPLICABLE --

END OF SECTION 01 60 00

SECTION 01 70 00

EXECUTION REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Pre-installation meetings.

C. Cutting and patching.

D. Surveying for laying out the work.

E. Cleaning and protection.

F. Starting of systems and equipment.

G. Demonstration and instruction of Owner personnel.

1.02 RELATED REQUIREMENTS

A. Section 01 30 00 - Submittals: Submittal procedures.

B. Section 01 45 00 - Quality Control: Testing and inspection procedures.

C. Individual Product Specification Sections:
   1. Advance notification to other sections of openings required in work of those sections.
   2. Limitations on cutting structural members.

1.03 SUBMITTALS

A. See Section 01 30 00 - "Submittals", for submittal procedures.

1.04 PROJECT CONDITIONS

A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

B. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.

1.05 COORDINATION

A. Coordinate scheduling, submittals, and requirements of Section 01 31 00 - "Coordination" to ensure efficient and orderly sequence of installation of interdependent construction elements.

B. Notify affected utility companies and comply with their requirements.

C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

– NOT APPLICABLE –

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Notify Architect four days in advance of meeting date.

D. Prepare agenda and preside at meeting:
   1. Review conditions of examination, preparation and installation procedures.
   2. Review coordination with related work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.05 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

C. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

D. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

E. Restore work with new products in accordance with requirements of Contract Documents.

F. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

G. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.06 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.07 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

E. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

3.08 SYSTEM STARTUP

A. Coordinate schedule for start-up of various equipment and systems.

B. Notify Architect and owner seven days prior to start-up of each item.

C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

E. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.

F. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

3.09 DEMONSTRATION AND INSTRUCTION

A. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.

B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

C. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of owner personnel.

3.10 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

END OF SECTION 01 70 00

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section includes administrative and procedural requirements for contract closeout including, but not limited to, the following:
   1. Inspection procedures for Completion Reviews.
   2. Final adjustments of accounts and payment.
   3. As-built drawings.
   4. Project record document submittal.
   5. Operation and maintenance manual submittal.
   6. Submittals and warranties.
   7. Final cleaning.

B. Closeout requirements for specific construction activities are included in the appropriate individual sections.

1.02 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspections for certification of Substantial Completion, complete the following:
   1. Conduct inspection to substantiate basis for request that Work is substantially complete. Create comprehensive list (initial punch list) indicating items to be completed or corrected, value of incomplete or non-conforming work, reason for being incomplete, and date of anticipated completion for each item.
   2. Advise the Owner of pending insurance changeover requirements.
   3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
   4. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates and similar releases.
   5. Submit record drawings, maintenance manuals, damage or settlement surveys, property surveys and similar final record information.
   6. Deliver tools, spare parts, extra stock and similar items.
   7. Make final changeover of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of changeover in security provisions.
   8. Complete startup testing of systems and instructions of the Owner's operation and maintenance personnel. Discontinue and remove temporary facilities from the site, along with mockups, construction tools and similar elements.
   9. Complete final cleanup requirements, including touchup painting.
   10. Touch up and otherwise repair and restore marred, exposed finishes.

1.03 FINAL COMPLETION REVIEW

A. Within 7 days after receipt of request for final review, Architect will make site review to determine whether Work is complete following procedures indicated in Conditions of the Contract.

B. Should Architect consider Work to be incomplete or defective:
   1. Architect will promptly notify Contractor listing incomplete or defective work.

C. Contractor shall take immediate steps to remedy stated deficiencies and send second written request to Architect the Work is complete.
   1. Architect will reinspect the Work.
   2. Revisits for Site Reviews:
      a. Should Architect have to re-perform site reviews due to failure of work to comply with claims of completion made by Contractor, Owner will reimburse Architect for such additional services and will deduct amount of compensation from final payment to Contractor.

1.04 EVIDENCE OF PAYMENTS AND RELEASE OF LIENS

A. Submit Contractor's affidavit of Payment of Debts and Claims on AIA Document G706.

B. Submit Contractor's affidavit of Release of Liens on AIA Document G706A with:
   1. Consent of Surety to Final Payment: AIA G707.
   2. Contractor's Release of Waiver of Liens.
   3. Separate releases or waivers of liens from subcontractors, suppliers and others with lien rights against property of Owner, together with list of those parties.

C. Execute Submittals before delivery to Owner.

1.05 FINAL ADJUSTMENTS OF ACCOUNTS

A. Submit final statement of accounting to Architect.

B. Show adjustments to Contract Sum:
   1. Original Contract Sum.
   2. Additions and deductions resulting from:
      a. Previous Change Orders.
      b. Allowances.
      c. Unit prices.
      d. Deductions for uncorrected work.
      e. Deductions for inspection payments.
      f. Other adjustments.
   3. Total Contract Sum.
   4. Previous Payments.
   5. Retainage.
   6. Sum remaining due.

C. Architect will prepare final Change Order reflecting approved adjustments to Contract Sum which are not included in Change Orders previously processed.

1.06 FINAL APPLICATION FOR PAYMENT

A. Submit final Application for Payment in accordance with procedures and requirements stated in Conditions of the Contract.

1.07 RECORD DOCUMENT SUBMITTALS (AS-BUILTS)

A. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings. Mark the set to show the actual installation where installation varies substantially from the work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
   1. Mark record sets with red ink. Use other colors to distinguish between variations in separate categories of the work.
   2. Mark new information that is important to the Owner but was not shown on Contract Drawings.

B. Maintenance Manuals: Organize operation and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual, heavy-duty, 2-inch, 3-ring, vinyl-covered binders, with pocket folders for folded sheet information. Furnish Architect with five (5) complete sets within 30 calendar days of initial Certificate of Occupancy. Mark appropriate identification on front and spine of each binder. Include the following types of information:
   1. Emergency instructions.
   2. Spare parts list.
   3. Copies of warranties.
   4. Wiring diagrams.
   5. Recommended "turn-around" cycles.
   6. Inspection procedures.
   7. Product data.
   8. Fixture lamping schedule.

C. Spare Parts and Extra Stock Inventory: Transmit spare parts and extra stock to the Owner with an inventory checklist for review by the Owner. Checklist shall include an itemized listing of each type of item and quantity, a method for the Owner to check off each item accepted, and a receipt for the Owner to sign and return to the Contractor accepting the entire inventory.

PART 2 PRODUCTS

-- NOT APPLICABLE --

PART 3 EXECUTION

3.01 CLOSEOUT PROCEDURES

A. Operation and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. Provide instructions by manufacturer's representatives if installers are not experienced in operation and maintenance procedures.
   1. Include a detailed review of the following items:
      a. Maintenance manuals.

b. Record documents.
c. Spare parts and manuals.
d. Tools.
e. Lubricants.
f. Fuels.
g. Identification systems.
h. Control sequences.
i. Hazards.
j. Cleaning.
k. Warranties and bonds.
l. Maintenance agreements and similar continuing commitments.

2. As part of the instructions for operating equipment, demonstrate the following procedures:
   a. Startup.
   b. Shutdown.
   c. Emergency operations.
   d. Noise and vibration adjustments.
   e. Safety procedures.
   f. Economy and efficiency adjustments.
   g. Effective energy utilization.

B. Delivery of Spare Parts and Extra Stock: Deliver spare parts and extra stock to storage location designated by the Owner.

3.02 FINAL CLEANING

A. General: The General Conditions require general cleaning during construction. Regular site cleaning is included in Section 01 70 00 - "Execution Requirements".

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

C. Removal of Protection: Remove temporary protection and facilities installed for protection of the work during construction.

D. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site as directed by the Owner.
   1. Where extra materials of value remain after completion of associated work, they become the Owner's property. Dispose of these materials as directed by the Owner.

END OF SECTION 01 77 00

SECTION 02 41 19

MINOR DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Removal of designated construction.

B. Disposal of materials.

1.02 REGULATORY REQUIREMENTS

A. Conform to applicable code(s) for demolition work, dust control, products requiring electrical disconnection and re-connection.

B. Obtain required permits from authorities.

C. Do not close or obstruct egress from any building exit or site exit.

D. Do not disable or disrupt building fire or life safety systems without 3 days' prior written notice to Owner.

E. Conform to applicable regulatory procedures when hazardous or contaminated materials are discovered.

1.03 PROJECT CONDITIONS

A. Conduct demolition to minimize interference with adjacent and occupied building areas.

B. Cease operations immediately if structure appears to be in danger and notify Architect. Do not resume operations until directed.

PART 2 PRODUCTS

-- NOT APPLICABLE --

PART 3 EXECUTION

3.01 DEMOLITION

A. Disconnect, remove and identify designated utilities within demolition areas.

B. Demolish in an orderly and careful manner. Protect existing supporting structural members.

C. Remove demolished materials from site except where specifically noted otherwise. Do not burn or bury materials on site.

D. Remove materials as demolition progresses. Upon completion of demolition, leave areas in clean condition.

E. Remove temporary facilities.

END OF SECTION 02 41 19

SECTION 06 20 00

FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Finish carpentry items other than shop prefabricated casework.

B. Hardware and attachment accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Support framing, grounds, and concealed blocking.

B. Section 06 10 53 - Wood Blocking and Curbing: Grounds and support framing.

C. Section 06 41 00 - Custom Cabinets: Shop fabricated custom cabinet work.

D. Section 08 14 00 - Wood Doors.

E. Section 08 71 00 - Door Hardware.

F. Section 09 90 00 - Painting and Coating: Painting and finishing of finish carpentry items.

G. Section 10 28 00 - Toilet, Bath and Laundry Accessories.

1.03 REFERENCE STANDARDS

A. ANSI/HPHA HP - American Standard for Hardwood and Decorative Plywood.

B. BHMA A156.9 - American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association; 2003 (ANSI/BHMA A156.9).

C. FS MM-L-736 - Lumber; Hardwood.

D. FS MMM-A-130 - Adhesive, Contact.

E. WI (MAN) - Manual of Millwork; Woodwork Institute; 2003.

1.04 SUBMITTALS

A. See Section 01 30 00 - "Submittals" for submittal procedures.

B. Product Data:
   1. Provide instructions for attachment hardware and finish hardware.

C. Samples: Submit two samples of finish plywood, 4 x 4 inch in size illustrating wood grain and specified finish.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products under provisions of Section 01 60 00 - "Product Requirements".

B. Store materials in ventilated, interior locations under constant minimum temperatures of 60 degrees F and maximum relative humidity of 55 percent.

C. Protect work from moisture damage.

PART 2 PRODUCTS

2.01 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

2.02 LUMBER MATERIALS

A. Softwood Lumber: PS 20; Custom Grade in accordance with WI (MAN). Douglas Fir Species, with flat grain, of quality capable of transparent finish.

B. Hardwood Lumber: FS MM-L-736; Premim Grade in accordance with WI (MAN). Birch species, with flat grain, of quality capable of tranparent finish.

2.03 SHEET MATERIALS

A. Softwood Plywood: PS 1; Standard Sheathing Grade, Group 1, CD Appearance Quality; Douglas Fir species, with face veneer of rotary cut grain.

B. Hardwood Plywood: ANSI/HPHA HP; Premium Grade in accordance with WI (MAN); veneer core material. Birch species, with face veneer of plain sliced grain.

2.04 WALL BASE

A. 1 x 4, as detailed. Birch species.

2.05 PLASTIC LAMINATE MATERIALS

A. Plastic Laminate: 0.050-inch General Purpose, manufactured by Formica, WilsonArt, or Nevamar.

2.06 ADHESIVE

A. Adhesive: Type recommended by laminate manufacturer to suit application.

B. Contact Adhesives: FS MMM-A-130; water base solvent release type.

C. Wall Adhesive: Solvent release, cartridge type, compatible with wall substrate, capable of achieving durable bond.

2.07 ACCESSORIES

A. Nails: Size and type to suit application, plain finish.

B. Bolts, Nuts, Washers, Blind Fasteners, Lags and Screws: Size and type to suit application; plain finish.

C. Lumber fo Shimming and Blocking: Softwood lumber of Western White Pine species.

D. Wood Filler: Solvent base, tinted to match surface finish color.

2.08 HARDWARE

A. Hardware: Comply with BHMA A156.9.

B. #255 shelf standards and #229 rests as manufactured by Knape & Vogt Manufacturing Company.

2.09 FABRICATION

A. Fabricate to WI (MAN) Custom Standards.

B. Shop prepare and identify components for book match grain matching during site erection.

2.10 SHOP FINISHING

A. Shop finish work in accordance with WI (MAN) 'Factory Finishing', Section 5.

B. Transparent Finish: WI (MAN) System Number 1; Premium.

C. Opaque Finish: WI (MAN) System Number 7; Premium.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify that surfaces and openings are ready to receive work and field measurements are as shown on Shop Drawings and/or as instructed by the fabricator.

C. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

D. Beginning of installation means acceptance of substrate.

3.02 PREPARATION

A. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

3.03 INSTALLATION

A. Install work in accordance with WI (MAN) Custom Quality Standard.

B. Set and secure materials and components in place, plumb and level.

C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

D. Install hardware supplied by Section 08 71 00 - "Door Hardware" in accordance with manufacturer's instructions.

E. Install Toilet and Bath accessories in accordance with manufacturer's instructions and as indicated on drawings.

3.04 PREPARATION FOR SITE FINISHING

A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.

B. Site Finishing: See Section 09 90 00 - "Painting and Coating".

3.05 TOLERANCES

A. Maximum Variation from True Position: 1/16 inch.

B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION 06 20 00

SECTION 07 92 23

SECURITY SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Security sealants, including high strength pick-resistant joint fillers, and accessories to seal interior working joints, seal joints at dissimilar materials in cells, and seal interior items for visual appearance and security.

1.02 REFERENCE STANDARDS

A. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; '10.

B. ASTM C1193 - Standard Guide for Use of Joint Sealants; '09.

C. ASTM D638 - Standard Test Method for Tensile Properties of Plastics; '10

D. SWRI - Sealant Waterproofing and Restoration Institute.

1.03 SUBMITTALS

A. See Section 01 30 00 - "Submittals", for submittal procedures.

B. Provide Schedule; Indicate joint locations and security sealant or joint filler selection and color for each joint.

C. Product Data: Provide manufacturer's product description, including conformance with specified requirements and installation instructions for each type security sealant or joint filler; Include specific requirements for primer and backer rod type.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. High Strength Pick-Resistant Joint Filler, HV2HS-1.
   1. Dural International Corp.
   2. Sika Corp.
   3. Schul International Corp.

B. Characteristics:
   1. Standard Quality: Shul International ; PrisonLoc 30.
   2. Multi-component non-sag adhesive, ASTM C881, Type II, Grade 3, Class B and C; minimum elongation at break 30%, ASTM D638 test method.
   3. Hardness: Shore D: 60.
   4. Joint Design: Five times movement.
   5. Self-extinguishing material.

C. System:
   1. Manufacturer's recommended bonding agent to surfaces receiving HV2HS-1.
   2. Place compressible filler between HV2HS-1 and precast concrete panel.
   3. Mix high strength pick-resistant joint filler; install as main filler in horizontal and vertical joints; size 5x for movement.

2.02 ACCESSORIES

A. Joint Cleaner: Type recommended by security sealant manufacturer for substrate indicated.

B. Joint Prime/Sealer: Type recommended by security sealant manufacturer for conditions encountered.

C. Bond Breaker Type: Plastic type recommended by security sealant manufacturer for application to contact surfaces to prevent bond substrate or joint filler for security sealant material performance.

D. Sealant Backer Rod:
   1. Type: Compressible rod stock closed cell foam, open cell foam, soft cell foam, or neoprene foam; type recommended by security sealant manufacturer for material compatibility and conditions encountered.
   2. Rod size and shape to control joint depth, break bond at joint bottom, form optimum shape of bead on back side, and minimize possibility of extrusion when joint is compressed.

E. Tooling Agent: Agent recommended by security sealant manufacturer to ensure contact of material with inner joint faces.

F. Divider Strips: Synthetic rubber or closed cell synthetic foam not less than 1/16" thick and full depth of security sealant material; approved by manufacturers of dissimilar materials as being compatible with each other.

PART 3 EXECUTION

3.01 PROTECTION

A. Protect adjacent surfaces by applying masking material or manipulating application equipment to keep materials in joint. Allowing tape to touch cleaned surfaces to receive security sealant if masking materials are used is prohibited.

B. Remove misapplied security sealant materials from surfaces using solvents and methods recommended by manufacturers.

C. Restore surfaces to original condition and appearance where security sealant materials have been removed.

3.02 PREPARATION

A. Surface Preparation:
   1. Clean joint surfaces immediately before caulking joints. Remove dirt, insecure coatings, moisture, and other substances interfering with bond.
   2. Etch concrete and masonry joint surfaces to remove alkalinity, unless security sealant material manufaturer's product data indicates alkalinity does not interfere with bond and performance; use security sealant manufacturer's recommended materials in accord with security sealant manufacturer's reviewed installaltion instructions and product data.

3. Roughen joint surfaces on vitreous coated and similar non-porous materials, unless security sealant material manufacturer's data indicates equal bond strength as porous surfaces. Rub with fine abrasive cloth or wool to produce dull sheen.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions and requirements of ASTM C962 and SWRI.

B. Primer: Prime or seal joint surfaces when recommended by security sealant material manufacturer.

C. Backer Rod: Install for security sealant materials, except where specifically recommended to be omitted by security sealant manufacturer for application indicated; install correct size for each joint type to security sealant manufacturer recommended depth.

D. Security Sealant Materials:
   1. Employ installation techniques ensuring materials are deposited in uniform, continuous ribbons without gaps or air pockets, with complete wetting of joint bond surfaces.
   2. Fill joint to form slight cove, to prevent joint from trapping moisture and debris where horizontal joints are between horizontal and vertical surfaces.
   3. Allowing materials to overflow or spill onto adjacent surfaces is prohibited. Use masking tape or other precautionary devices to prevent adjacent surface staining.
   4. Remove excess and misplaced materials as work progresses. Clean adjoining surfaces to eliminate evidence of misplaced materials without damage to adjacent surfaces or finishes.
   5. Cure in accord with manufacturer's product data to obtain high early bond strength, internal cohesive strength, and surface durability.

END OF SECTION 07 92 23

SECTION 08 34 63

DETENTION METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hollow metal detention security products as shown in the contract drawings.

1.02 RELATED REQUIREMENTS

A. Section 08 56 63 - Detention Metal Windows.

B. Section 08 71 53 - Security Door Hardware.

C. Section 08 88 53 - Security Glazing.

1.03 REFERENCE STANDARDS

A. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; '11.

B. ASTM A366/A366M - Standard Specification for Commercial Steel (CS) Sheet, Carbon (0.15 Maximum Percent) Cold Rolled; '97e1.

C. ASTM A569/A569M - Standard Specification for Steel, Carbon (0.15 Maximum, Percent), Hot Rolled Sheet and Strip Commercial; '98.

D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; '10.

E. ASTM 1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High Strength Low-Alloy with Improved Formability, and Ultra-High Strength; '10.

F. UL - Underwriters Laboratories, Inc.

1.04 DESIGN

A. Protection Level shall be UL Level 8.

B. Fire Rating (Door and Frame): 20 min.

C. The door and frame must be manufactured by the same firm. Units must be manufactured in strict accordance with specifications, design and details. No field alterations to the construction of the units fabricated under the acceptable standards shall be allowed unless approved by the manufacturer and Architect.

D. All welds shall be in accordance with the requirements and standard practices of the American Welding Society (AWS). All exposed welds shall be ground flush and finished smooth.

1.05 SUBMITTALS

A. See Section 01 30 00 - "Submittals", for submittal procedures.

B. Shop Drawings:

1. Show door and frame elevations, sections and construction.
2. Show listing of opening descriptions including quantities, gauges, locations and anchors.
3. Identify materials on the submittal such that they may be referenced by markings used on the contract drawings.
4. Indicate Performance Grade levels on the submittal.
5. Submit for approval prior to fabrication, Verification of UL Listing of Bullet Resistance Composite.

1.06 QUALITY ASSURANCE

A. Qualified manufacturers shall have a minimum of ten (10) consecutive years of experience regularly and successfully producing hollow metal of the type required for this project. This experience shall be substantiated by a list of representative projects for which the manufacturer has supplied detention security hollow metal including dates of the project completion.

B. All security hollow metal doors and frames shall be produced by the same manufacturer. All fire and ballistic rated security hollow metal assemblies shall bear a UL label.

1.07 DELIVERY, STORAGE, AND HANDLING

A. It shall be the responsibility of the General Contractor to see that any scratches or disfigurement caused in shipping and handling of the products are promptly cleaned, touched-up, properly stored in a dry location and covered to protect them from damage.

1.08 WARRANTY

A. All materials and workmanship shall be warranted against defects for a period of one (1) year from date of receipt at job site.

B. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Trussbilt (Preapproved) - To Match Existing.

2.02 MATERIALS

A. Hollow Metal Doors (Match Existing).
   1. Doors shall be constructed of commercial quality, level, cold-rolled steel conforming to ASTM A1008/A1008M or hot rolled, pickled and oiled steel conforming to ASTM A1011/A1011M. The steel shall be free of scale, pitting, coil breaks or other surface blemishes. The steel shall also be free of buckles, waves or any other defects caused by the use of improperly leveled sheets.
   2. Interior Doors: Face sheets shall be 14 gauge minimum thickness and shall have a zinc coating applied by the hot-dip process conforming to ASTM A653/A653M, Coating designation A60.
   3. Hardware Reinforcements:

a. Doors shall be mortised, reinforced, drilled and tapped at the factory for fully templated mortised hardware only, in accordance with the final approved Hardware Schedule and templates provided by the hardware supplier.

4. Glass Moldings and Stops:
   a. Door shall be provided with steel moldings to secure glazing by others, in accordance with glass sizes and thicknesses provided by the contractor and shown on approved Shop Drawings.
   b. Fixed glazing molding shall be not less than 12 gauge and shall be spot welded to both face sheets 3 inch oc maximum.
5. Food Pass Openings:
   a. The food pass opening shall be a flush opening fabricated using interior channels, 12 gauge thickness, securely welded to the inside of both face sheets. The four corner seams shall be continuously welded from the interior side. The finished opening shall be of such construction that it cannot be dismantled or otherwise affected by tampering or scraping.
   b. The food pass shutter shall be constructed from two (2) 10 gauge steel plates spot welded together to produce an inset fit that, when closed, will prevent tampering with the lock and hinges.
   c. The shutters shall be treated for maximum paint adhesion and given a shop coat of rust inhibitive primer. Shutter shall be shipped loose for installation in the field by others.

B. Hollow Metal Frames.
1. Frames shall be constructed of commercial quality, cold rolled steel conforming to ASTM A366/A366M or hot rolled, pickled and oiled steel conforming to ASTM A569/A569M. The steel shall be free of scale, pitting, coil breaks or other surface defects.
2. Exterior Openings: Steel for these openings shall be 12 gauge minimum thickness and have a zinc coating applied by the hop-dip process conforming to ASTM A653/A653M, Coating Designation A60.
3. Hardware Reinforcement and Preparation:
   a. Frames shall be mortised, reinforced, drilled and tapped for all templated mortised hardware only, in accordance with the final approved Hardware Schedule and templates provided by the hardware supplier.
   b. Frames for installation in existing masonry or concrete walls shall be prepared for expansion bolt type anchors. The preparation shall consist of a countersunk hole for a 3/8 inch diameter bolt and a spacer from the unexposed surface of the frame to the wall. The spacer shall be welded to the frame.
      1) After sufficient tightening of the bolt, the bolt head shall be welded by the installation contractor so as to provide a non-removable condition. The welded bolt head shall be ground, dressed and finished smooth.

2.03 FINISH

A. After fabrication, all tool marks and surface imperfections shall be filled and sanded as required to make exposed surfaces smooth and free from irregularities. After appropriate metal preparation, all exposed surfaces of doors and frames shall

receive a factory applied rust inhibitive primer. Primer must be fully cured prior to shipment.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Frame jambs shall be fully grouted to provide added security protection against battering, wedging, spreading and other means of forcing open the door.

C. Hardware shall be applied in accordance with hardware manufacturer's templates and instructions.

3.02 CLEANING

A. Any grout or other bonding material shall be cleaned off of frames or doors immediately following installation. Hollow metal surfaces shall be kept free fo grout, tar, or other bonding material or sealer.

B. Primed or painted suraces which have been scratched or otherwise marred during installation (including field welding) and/or cleaning shall promptly be finished smooth, cleaned, treated for maximum paint adhesion and touched up with a rust inhibitve primer.

END OF SECTION 08 34 63

SECTION 08 56 63

DETENTION METAL WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Detention windows as shown in the contract drawings.

1.02 RELATED REQUIREMENTS

A. Section 08 34 63 - Detention Metal Doors and Frames.

B. Section 08 88 53 - Security Glazing.

1.03 DESIGN

A. Protection Level shall be UL Level 8.

B. Fire Rating: 45 minutes.

C. Frames shall be of a protection level equal to or greater than the glazing. Units must be manufactured in strict accordance with the specifications, design and details. No field alterations to the construction of the units fabricated under the acceptable standards shall be allowed unless approved by the manufacturer and the Architect.

D. All welds shall be in accordance with the requirements and standard practices of the American Welding Society (AWS). All exposed welds shall be ground flush and finished smooth.

1.04 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; '10.

B. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; '11.

C. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High Strength Low-Alloy with Improved Formability and Ultra-High Strength; '10.

D. UL - Underwriters Laboratories, Inc.

1.05 SUBMITTALS

A. See Section 01 30 00 - "Submittals", for submittal procedures.

B. Shop Drawings:
   1. Show fixed detention window elevations, sections and construction.
   2. Show listing of opening descriptions including quantities, gauges, locations and anchors.
   3. Identify materials on the submittal such that they may be referenced by markings used on the contract drawings.

1.06 QUALITY ASSURANCE

A. Qualified manufacurers shall have a minimum of ten (10) consecutive years of experience regularly and successfully producing fixed detention windows of the type required for this project. This experience shall be substantiated by a list of representative projects for which the manufacturer has supplied fixed detention wndows including dates of the project completion.

B. All fire and ballistic rated detention metal windows shall bear a UL label.

1.07 DELIVERY, STORAGE, AND HANDLING

A. It shall be the responsibility of the General Contractor to see that any scratches or disfigurement caused in shipping and handling of the products are promptly cleaned, touched up, properly stored in a dry location and covered to protect them from damage.

1.08 WARRANTY

A. All materials and workmanship shall be warranted against defects for a period of one (1) year from date of receipt at job site.

B. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Trussbilt (preapproved) - to match existing.

2.02 MATERIALS

A. Fixed Detention Windows (Match Existing).
   1. Detention windows shall be constructed of commercial quality, cold rolled steel conforming to ASTM A1008/A1008M or hot rolled, pickled and oiled steel conforming to ASTM A1011/A1011M. The steel shall be free of scale, pitting, coil breaks or other surface defects.
   2. Exterior fixed detention windows: Steel for these openings shall be 12 gauge minimum thickness and shall have a zinc coating applied by the hot-dip process conforming to ASTM A653/A653M (A60).
   3. All fixed detention windows shall have integral stops and be welded units of the sizes and types shown in the contract documents and on the approved Shop Drawings.
   4. Fixed detention windows for installation in existing masonry or concrete walls shall be prepared for expansion bolt type anchors. The preparation shall consist of a countersunk hole for a 3/8 inch diameter bolt and a spacer from the unexposed surface of the frame to the wall. The spacer shall be welded to the frame.
      a. After sufficient tightening of the bolt, the bolt head shall be welded by the installation contractor so as to provide a non-removable condition. The welded bolt head shall be ground, dressed and finished smooth.

2.03 FINISH

A. After fabrication, all tool marks and surface imperfections shall be filled and sanded as required to make exposed surfaces smooth and free from irregularities. After appropriate metal preparation, all exposed surfaces of windows shall receive a factory applied rust inhibitive primer. Primer must be fully cured prior to shipment.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Frame jambs shall be fully grouted to provide added security protection against battering, wedging, spreading and other means of forcing open the window.

3.02 CLEANING

A. Any grout or other bonding material shall be cleaned off of windows immediately following installation. Window surfaces shall be kept free of grout, tar, or other bonding material or sealer.

B. Primed or painted surfaces which have been scratched or otherwise marred during installation (including field welding) and/or cleaning shall promptly be finished smooth, cleaned, treated for maximum paint adhesion and touched up with a rust inhibitive primer.

END OF SECTION 08 56 63

SECTION 08 71 53

SECURITY DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hardware for security hollow steel doors and frames.

1.02 RELATED REQUIREMENTS

A. Section 08 34 63 - Detention Doors and Frames.

1.03 REFERENCE STANDARDS

A. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 2003.

B. SDI - Steel Door Institute.

1.04 COORDINATION

A. Coordinate the manufacture, fabrication, and installation of products onto which door hardware will be installed.

B. Coordinate work of this section with other directly affected sections involving manufacture of any internal reinforcement for door hardware.

1.05 REGULATORY REQUIREMENTS

A. Conform to applicable code for requirements to fire rated doors and frames.

1.06 SUBMITTALS

A. See Section 01 30 00 - "Submittals", for submittal procedures.

B. Indicate locations and mounting heights of each type of hardware.

C. Submit Schedule of Hardware.

D. Provide product data on specified hardware.

E. Submit manufacturer's parts lists, templates and installation instructions.

1.07 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data.

B. Include data on operating hardware, lubrication requirements, and inspection procedures related to preventive maintenance.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store and protect products under provisions of Section 01 60 00 - "Product Requirements".

B. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

C. Deliver keys to Owner by security shipment direct from hardware supplier.

D. Protect hardware from theft by cataloging and storing in secure area.

1.09 MAINTENANCE PRODUCTS

A. Provide special wrenches and tools applicable to each different or special hardware component.

B. Provide maintenance tools and accessories supplied by hardware component manufacturer.

1.10 WARRANTY

A. Provide five year warranty.

PART 2 PRODUCTS

2.01 KEYING

A. Contractor to provide cores,keyed to match existing system. The Owner to provide existing key system information.

B. Supply two (2) keys for each lock.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that doors and frames are ready to receive work and dimensions are as instructed by the manufacturer.

B. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions, requirements of SDI and applicable codes.

B. Use templates provided by hardware item manufacturer.

C. Conform to ANSI A117.1 for positioning requirements for the handicapped.

3.03 SCHEDULE

HDG #1

(Similar to Existing Safety Cell Doors #IR 25.1 & IR 24.1)

Dr #1, 2

EACH DOOR TO HAVE:

2 Ea	Hinge	#3FP x USP	Brink
3 Ea	Hinge	#4-1/2 x STUD x US32D	Brink
1 Ea	Lock	7017 x SEC. TORX x USP	Brink
1 Ea	Lock	5022M x 24VDC x SEC. TORX x US32D	Brink

2 Ea	Cylinder	MOGUL CYLINDER x USD26D	Brink
1 Ea	Closer	2210 x SEC. TORX x AL	LCN
1 Ea	Pull	INTEGRAL FLUSH PULL	HM
1 Ea	Pull	30021 x SEC. TORX x US32D GRIP PULL	Brink
1 EA	Dr Stop	NW 606	NW

END OF SECTION 08 71 53

SECTION 08 88 53

SECURITY GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Security glazing and accessories for exterior windows.

1.02 REFERENCE STANDARDS

A. ANSI Z97.1 - Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.

B. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; '10.

C. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Consumer Product Safety Commission.

D. FGMA - Flat Glass Marketing Association.

1.03 SUBMITTALS

A. See Section 01 30 00 - "Submittals", for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog cuts.

1.04 QUALITY ASSURANCE

A. Certified Safety Glazing: Provide Category II products which comply with 16 CFR 1201 and ANSI Z97.1.

B. Security Glazing Performance: Provide test reports showing compliance with tests specified for specific glazing types.

C. Sealant Substrate Tests: Have manufacturer of sealant test glazing materials, glass, and substrates for proper adhesion and compatibility.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to project site in conformance with Section 01 60 00 - "Product Requirements".

B. Protect products in accordance with manufacturer's recommendations. Avoid damage to glass edges, prevent damage due to temperature changes, sunlight, and moisture.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Viracon, Owatonna, MN.

B. Globe Amerada Glass Co., Elk Grove Village, IL.

C. Falconer Glass Industries, Falconer, NY.

2.02 MATERIALS

A. Basic Glass Products.
   1. Polycarbonate Sheet, Rigid, flat polycarbonate sheet.
      a. Flammability: Less than 1 inch in accordance with ASTM D635.
      b. UV and Mar-resistant coating: Apply to all surfaces exposed to air.

B. Glass Types (Match Existing).
   1. General: See Door and Window Schedules on Drawings. Select products to comply with performance requirements indicated, in accordance with the manufacturer's recommendations.
      a. 13/16" glass-clad polycarbonate security glazing.
      b. 20 minute fire-rated security glazing.

2.03 ACCESSORIES

A. Glazing Blocks: Neoprene, EPDM or silicone.
   1. Setting blocks: 80 to 90 Shore A hardness.
   2. Spacers: As required to provide space and edge clearances recommended by FGMA.

B. Glazing Sealants:
   1. General: Comply with recommendation of sealant and glass manufacturers for selection of glazing sealants which have performance characteristics suitable for applications indicated and conditions at time of installation. Glaze with sealant at all locations. Glazing tape is not acceptable.
   2. Compatibility: Select sealants with proven compatibility with surfaces contacted in the installation and under service conditions indicated. Comply with Section 07 92 23 - "Security Sealants".

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Comply with recommendations for installation contained in the FGMA "Glazing Manual" and "Sealant Manual".

C. Protect glazing from edge damage during handling and installation.

3.02 GLAZING IN FRAMES

A. Permanently adhere setting and edge blocks to frame.

B. Applied Stops: Fasten as indicated, after glazing has been set in frame.

C. Sealants:
   1. Use continuous spacers.
   2. Use primer where required.
   3. Tool sealant.

D. Sealant Tape: Install tape continuously.

E. Compression Gaskets: Secure gaskets so they will not work out under normal movement.

3.03 PROTECTION AND CLEANING

A. Immediately after installing glazing in frames, apply warning tape or bands across opening without touching anything.

B. Cover exposed polycarbonate surfaces with heavy paper secured with tape, without touching glazing.

C. Protect glazing during subsequent construction operations. Clean off excess sealants as work progresses.

D. Replace glazing that is damaged.

E. Wash both sides of glazing and clean polycarbonate surfaces using manufacturer's recommended procedures.

END OF SECTION 08 88 53

SECTION 09 90 00

PAINTING AND COATING

PART 1 GENERAL

1.01 WORK INCLUDED

A. Surface preparation.

B. Field application of paints, stains, and other coatings.

C. See Surface Finish Schedule.

1.02 RELATED WORK

A. Section 05 50 00 - Metal Fabrications: Shop-primed items.

B. Section 06 41 00 - Custom Cabinets: Shop finished cabinet work.

C. Section 09 21 16 - Gypsum Board Assemblies: Wall primers prior to texturing.

D. Section 26 05 53 - Electrical Identification: Painted identification.

E. Section 32 13 13 - Portland Cement Concrete Paving: Pavement markings.

1.03 REFERENCE STANDARDS

A. ANSI/ASTM D16 - Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.

B. ASTM D2016 - Test Method for Moisture Content of Wood.

1.04 DEFINITIONS

A. Conform to ANSI/ASTM D16 for interpretation of terms used in this section.

1.05 QUALITY ASSURANCE

A. Product Manufacturer: Company specializing in manufacturing quality paint and finish products with three years experience.

B. Applicator: Company specializing in commercial painting and finishing approved by product manufacturer.

1.06 SUBMITTALS

A. See Section 01 30 00 - "Submittals", for submittal procedures.

B. Submit product data under provisions of Division 1.

C. Submit samples under provisions of Division 1.

D. Submit two samples 8 x 10-inch in size illustrating range of colors and textures available for each surface finishing product scheduled, for selection.

E. Submit manufacturer's application instructions.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 01 60 00 - "Product Requirements".

B. Store and protect products under provisions of Section 01 60 00.

C. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

D. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

E. Store paint materials at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in well ventilated area, unless required otherwise by manufacturer's instructions.

F. Take precautionary measures to prevent fire hazards and spontaneous combustion.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Provide continuous ventilation and heating facilities to maintain surface and ambient temperatures above 45 degrees F (7 degrees C) for 24 hours before, during, and 48 hours after application of finishes, unless required otherwise by manufacturer's instructions.

B. Do not apply exterior coatings during rain or snow, or when relative humidity is above 50 percent, unless required otherwise by manufacturer's instructions.

C. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.

D. Minimum Application Temperature for Varnish Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft-candles measured mid-height at substrate surface.

1.09 EXTRA MATERIALS

A. Supply 1 gallon of each color and type; store where directed.

B. Label each container with color, texture and room locations, in addition to the manufacturer's label.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS - PAINT

A. Ameritone.

B. Dunn-Edwards.

C. Frazee.

D. Vista Paint Paint Corp., Fullerton, CA.

E. Rust-Oleum Industrial Coatings

F. Carboline Protective Coatings

G. Chevron Asphalt Co. (Pavement Markings)

H. Substitutions and Product Options: Under provisions of Section 01 60 00 - "Product Requirements".

2.02 ACCEPTABLE MANUFACTURERS - VARNISH AND URETHANE

A. Fullerton O'Brien

B. Valspar

C. Substitutions and Product Options: Under provisions of Section 01 60 00 - "Product Requirements".

2.03 ACCEPTABLE MANUFACTURERS - STAIN

A. Olympic.

B. Substitutions and Product Options: Under provisions of Section 01 60 00.

2.04 ACCEPTABLE MANUFACTURERS - PRIMER-SEALERS

A. Vista Paint.

B. Dunn-Edwards or as recommended by manufacturer.

C. Rust-Oleum Industrial Coatings.

D. Carboline Protective Coatings.

E. Substitutions and Product Options: Under provisions of Section 01 60 00.

2.05 ACCEPTABLE MANUFACTURERS - BLOCK FILLER

A. Tuff-Kote - Product: Tuff-Hide or as recommended by manufacturer.

B. Vista Paint - 018. 100% Acrylic Block Filler.

C. Substitutions and Product Options: Under provisions of Section 01 60 00 - "Product Requirements".

2.06 MATERIALS

A. Coatings: Ready mixed, except field catalyzed coatings. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating.

B. Coatings: Good flow and brushing properties; capable of drying or curing free of streaks or sags.

C. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.

2.07 FINISHES

A. Refer to schedule at end of Section for surface finish schedule.

PART 3 EXECUTION

3.01 INSPECTION

A. Verify that surfaces are ready to receive Work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

C. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Plaster and Gypsum Wallboard: 12 percent.
   2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
   3. Interior Located Wood: 15 percent, measured in accordance with ASTM D2016.

D. Beginning of installation means acceptance of existing surfaces.

3.02 PREPARATION

A. Remove electrical plates, hardware, light fixture trim, and fittings prior to preparing surfaces or finishing.

B. Surfaces: Correct defects and clean surfaces which affect work of this section.

C. Shellac and seal marks which may bleed through surface finishes.

D. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

E. Aluminum Surfaces Scheduled for Paint Finish: Remove surface contamination by steam or high pressure water. Remove oxidation with acid etch and solvent washing. Apply etching primer immediately following cleaning.

F. Gypsum Board Surfaces to be Painted: Latex fill minor defects. Spot prime defects after repair.

G. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

H. Concrete and Unit Masonry Surfaces Scheduled to Receive Paint Finish: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.

I. Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.

J. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.

K. Interior Wood Items Scheduled to Receive Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats.

L. Exterior Wood Scheduled to Receive Paint Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied.

M. Wood and Metal Doors Scheduled for Painting: Seal top and bottom edges with primer.

3.03 PROTECTION

A. Protect elements surrounding the work of this section from damage or disfiguration.

B. Repair damage to other surfaces caused by work of this section.

C. Furnish drop cloths, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.

D. Remove empty paint containers from site.

3.04 APPLICATION

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

B. Do not apply finishes to surfaces that are not dry.

C. Apply each coat to uniform appearance.

D. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.

E. Sand lightly between coats to achieve required finish.

F. Allow applied coat to dry before next coat is applied.

G. Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

H. Prime back surfaces of interior and exterior woodwork with primer paint.

I. Prime back surfaces of interior woodwork scheduled to receive stain or varnish finish with gloss varnish reduced 25 percent with mineral spirits.

3.05 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

A. Paint shop-primed equipment, where indicated.

B. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

C. Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, except where items are prefinished.

D. Replace identification markings on mechanical or electrical equipment when painted accidentally.

E. Paint interior surfaces of air ducts, and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint, to limit of sight line. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.

F. Paint exposed conduit and electrical equipment occurring in finished areas.

G. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

H. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.06 CLEANING

A. As Work proceeds, promptly remove paint where spilled, splashed, or spattered.

B. During progress of Work maintain premises free of unnecessary accumulation of tools, equipment, surplus materials, and debris.

C. Collect cotton waste, cloths, and material which may constitute a fire hazard, place in closed metal containers and remove daily from site.

3.07 SCHEDULE - EXTERIOR SURFACES

A. Wood - Transparent:
   1. One coat stain. Olympic Stain, Semi-Transparent.
   2. One coat sealer. As directed.

B. Wood Siding:
   1. One coat acrylic wood primer.
   2. Two coats acrylic paint: Dunn-Edwards Spartashell.

C. Concrete, Concrete Block:
   1. One coat block primer. Vista Paint 018 100% Acrylic Block Filler.
   2. One coat primer sealer latex. Vista Paint 4600 Uniprime II.
   3. One coat latex paint. Vista Paint 3000 Acribond.

D. Steel - Unprimed:
   1. One coat zinc chromate primer. Vista Paint 4800 Metal Pro or Carbomastic 90.
   2. Two coats acrylic enamel semi-gloss. Vista Paint 8400 Semi-Gloss or 7900 Premogloss or Carboline 133 VOC.

E. Steel - Shop Primed:
   1. Touch-up with zinc chromate primer. Vista Paint 4800 Metal Pro or Carbozinc 90.
   2. Two coats alkyd enamel semi-gloss. Vista Paint 8400 Semi-Gloss or 7900

Premogloss or Carboline 133 VOC.

F. Steel - Galvanized (where indicated):
   1. Pretreatment: Jasco Prep N Prime.
   2. One coat zinc chromate primer. Vista Paint 4800 Metal Pro or Carbozinc 90.
   3. Two coats acrylic enamel, semi-gloss. Vista Paint 8400 Semi-Gloss or 7900 Premogloss or Carboline 133 VOC.

G. Pavement Markings:
   1. "Laycold Line Paint" or Vista Paint 6900 On-Line Traffic Marking Paint.

3.08 SCHEDULE - INTERIOR SURFACES

A. Wood - Painted:
   1. One coat alkyd prime sealer. Vista Paint 6600 Aqua Lac.
   2. Two coats latex, eggshell. Vista Paint 8300 Carefree Eggshell.

B. Wood - Transparent:
   1. Filler coat (for open grained wood only).
   2. One coat stain. VWS Series.
   3. One coat sealer. Valspar NAS 1820.
   4. One coat varnish satin. Valspar NAS 1822.

C. Concrete:
   1. One coat block filler. Vista Paint 018 100% Acrylic Block Filler.
   2. One coat primer sealer latex. Vista Paint 4600 Uniprime II
   3. One coat latex, eggshell. Vista Paint 8300 Carefree Eggshell.

D. Steel - Unprimed:
   1. One coat zinc chromate primer. Vista Paint 4800 Metal Pro.
   2. Two coats semi-gloss. Vista Paint 8400 Carefree Semi-Gloss or Rust-Oleum Sierra S70 or S71 Primer and Rust-Oleum Sierra S22 Finish.

E. Steel - Primed:
   1. Touch-up with original primer. Vista Paint 4800 Metal Pro.
   2. Two coats semi-gloss. Vista Paint 8400 Carefree Semi-Gloss or Rust Oleum Sierra S70 or S71 Primer and Rust-Oleum Sierra S22 Finish.

F. Steel - Galvanized:
   1. Preteatment: Jasco Prep N Prime.
   2. One coat zinc chromate primer. Vista Paint 4800 Metal Pro.
   3. Two coats semi-gloss. Vista Paint 8400 Carefree Semi-Gloss or Rust-Oleum Sierra S70 or S71 Primer and Rust-Oleum Sierra S22 Finish.

G. Plaster, Gypsum Board
   1. One coat alkyd primer sealer. Vista Paint 1100 High Build PVA.
   2. Two coats alkyd enamel, eggshell. Vista Paint 8300 Carefree Eggshell.

END OF SECTION 09 90 00

SECTION 11 19 23

SECURITY METAL WALL PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish and install security metal wall panels, filled with concrete grout.

1.02 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; '10.

B. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus; '09.

C. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss at Building Partitions and Elements; '09.

D. ASTM F2322 - Standard Test Methods for Physical Assault on Vertical Fixed Barriers for Detention and Correctional Facilities; '03.

E. NAAMM HMMA-820 TN01 - Grouting Hollow Metal Frames; National Association of Architectural Metal Manufacturers; '03.

F. UL 752 - Standard of Safety for Bullet-Resisting Equipment.

1.03 SUBMITTALS

A. See Section 01 30 00 - "Submittals", for submittal procedures.

B. Product Data: Provide manufacturer's catalog cut sheets, including installation instructions.

C. Shop Drawings: Indicate panel elevations and sections. Indicate connections to existing walls.

D. Samples: Submit two wall panels, 12 x 12-inch in size, illustrating internal construction.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

B. Manufacturer shall have evidence of having successfully completed steel wall project of at least 100 cells that has been in continual operation for a minimum of ten (10) years.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to project site on flatbed trailers for side off-loding. Panels shall be palletized with a maximum weight of 5,000 pounds.

B. Shipping damage and quantity discrepancies shall be noted on the bills of lading and receiving documents and shall be reported to the panel manufacturer within 48 hours of unloading.

C. Store materials under cover and elevated above grade. Panels shall be stored in a horizontal position and spaced by blocking. Materials shall be covered to protect them from damage but in such a manner as to permit air circulation.

1.06 WARRANTY

A. All panels shall be warranted by the panel manufacturer from defects in workmanship and quality for a period of ten (10) years from date of shipment.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Trussbilt, LLC - Vadnais Heights, MN. Tel: 651-633-6100, or approved equal.

B. Substitutions and Product Options: Under provisions of Section 01 60 00 - "Product Requirements".

2.02 FIRE RATED HOLLOW SECURITY METAL WALL PANELS

A. Materials (Match Existing).
   1. Panel face sheets shall be constructed of 0.093-inch minimum thickness steel and shall have a zinc coating applied by the hot-dip process conforming to ASTM A653/A653M Commercial Steel (CS), coating designation A60 (Z180). The steel shall be free of scale, pitting, coil breaks or other surface blemishes. It shall also be free of buckles, waves or any other defects caused by the use of improperly leveled sheets.
   2. Floor mounting channels, mounting angles, channels and cover plates shall be constructed of 0.123-inch minimum thickness steel conforming to ASTM A653/A653M Commercial Steel (CS), coating designation A60 (Z180).
   3. All panels shall be fully grouted in the field by the wall panel manufacturer. Grout specifications shall be the manufacturer's proprietary design conforming to structural and STC ratings.

B. Construction.
   1. All panels shall be of the types and sizes shown on the approved Shop Drawings, shall be constructed in accordance with the specifications and shall meet the performance requirements as specified herein.
   2. Panel face sheets shall have rabbeted edges that are not directly connected via steel-to-steel contact to preclude heat transfer the full height of the panel.
   3. Panel thickness shall be 2-29/32 inches minimum and furnished with grout holes along the top edge for grouting in place at the job site. After grouting, grout holes will be concealed by a coverplate. Panels shall be neat in appearance and free from warpage or buckle. Edge bends shall be true and straight and of minimum radius for the thickness of material used.
   4. Panels shall be stiffened by one of the following systems:

a. Continuous steel truss design core material, 0.015-inch minimum mild steel, having truncated triangular sections extending continuously from one panel face to the other, spot welded to each face sheet 2-3/4 inch oc horizontally and 3 inch oc vertically. Core material shall extend the full height and width of the panel.
b. Rolled or formed 1/8 inch mild steel channels extending from top to bottom of panel and continuous from one face to the other, spaced not more than 4 inch oc and welded to both panel faces not more than 3 inch oc vertically.

5. Mechanical, Electrical and Plumbing (MEP) Penetrations.
a. Where specified, panels shall be provided with MEP cutouts reinforced with steel molding, not less than 0.093-inch.
b. All MEP penetration locations shall be verified by the MEP contractors on the approved Shop Drawings. Non-verified penetration locations shall be the responsibility of the MEP contractors and shall be cut and grout protected in the field by others.
c. Installation of listed fire stop materials shall be the responsibility of the installing MEP contractor maintaining the specified fire rating of the wall system.

C. Fire Rating: One Hour.

2.03 WALL PANEL FINISH

A. After fabrication, all tool marks and surface imperfections shall be filled and sanded as required to make face sheets, vertical edges and weld joints free from irregularities. After appropriate metal preparation, all exposed surfaces of panels shall be factory primed. Primer shall meet ASTM B117, Salt spray for 150 hours with a rust grade of not less than 6.

B. Paint: As specified in Section 09 90 00 - "Painting and Coating".

2.04 TESTING AND PERFORMANCE

A. Wall Assembly Impact Test performed in accordance wtih ASTM F2322.

B. Bullet Resistance Test.
1. Bullet resistance shall be tested under UL Standard 752 by an accredited testing laboratory. The bullet resistance rating shall be Level 8.

C. Acoustical Test shall be conducted in accordance with ASTM E90.
1. Minimum STC rating of 45 - 49.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Verify that floor slab complies with project standards.

B. Prior to installation, all panels, mounting channels and angles shall be checked for size and staged at the appropriate locations.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install floor channels with fasteners and ceiling angles as required by approved Shop Drawings and manufacturer's installation instructions.

C. Weld panels to floor channels, wall and ceiling mounting angles and weld panel seams as required by engineering documentation and manufacturer's recommendations. Caulk between welds using a two-part epoxy caulk, Pecora Pick Proof Caulk or equivalent. Exposed field welds shall be finished smooth and touched up with a rust inhibitive primer prior to caulking.

D. Weld panel seams as required by engineering documentation and manufacturer's recommendations.

E. Panel Installation Tolerances:
   1. Wall panel plumbness: 1/8-inch in 10 ft.
   2. Vertical alignment: 1/4-inch.
   3. Panel to panel face alignment: 1/16-inch.
   4. Weld length: +1/2-inch; -0 inch.
   5. Weld spacing: +/- 1/2-inch.
   6. Wall straightness: +/- 1/2-inch in 80 ft.

F. After installation, wall panels and frames shall be fully grouted by the panel manufacturer. Grout mix and slump to be per the manufacturer's recommendations. Refer to NAAMM HMMA-820 TN01-03 for the proper grouting of frames.

G. Any grout or other bonding material shall be cleaned off of panels immediately following installation. Exposed panel surfaces shall be kept free of grout, tar, or other bonding material or sealer.

H. Install all furnishings per approved Shop Drawings and manufacturer's installation instructions.

I. Primed or painted surfaces which have been scratched or otherwise marred during installation (including field welding) and /or cleaning shall promptly be finished smooth, cleaned, treated for maximum paint adhesion and touched up with a rust inhibitive primer comparable and compatible to shop applied primer.

J. Clean and remove debris, leaving cells ready for installation of plumbing, electrical, heating/ventilation, furniture and other trades or materials.

END OF SECTION 11 19 23

SECTION 11 19 51

RESILIENT SAFETY PADDING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section includes furnishing and installation of resilient safety padding for detention cells.

1.02 REFERENCE STANDARDS

A. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers Tension; '06ae2.

B. ASTM D2240 - Standard Test Method for Rubber Property Durometer Hardness; '05 (2010).

C. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; '10b.

1.03 REGULATORY REQUIREMENTS

A. Provide products approved by the California State Fire Marshal's Code.

1.04 PROJECT CONDITIONS

A. Maintain a minimum temperature of 65 degrees F for duration of installation of safety padding.

B. Do not use curing agents on concrete floors to receive resilient cell padding.

1.05 SUBMITTALS

A. See Section 01 30 00 - "Submittals", for submittal procedures.

B. Product Data: Provide product data of specified products, including maintenance instructions.

C. Provide Manufacaturer's Installation Instructions, including perimeter conditions requiring special attention.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer who has a minimum of five years experience in the fabrication and installation of protection padding similar in material, design, and extent to that indicated for this Project and with a record of five successful installations of protection padding.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver and handle products in accordance with requirements of Section 01 60 00 - "Product Requirements".

B. Store products under cover and elevated above grade.

1.08 WARRANTY

A. Provide warranty agreeing to repair or replace all defective material or work for a period of three years from the date of Substantial Completion. Include in warranty any loss of adhesion, resiliency, or delamination. Warranty does not cover damage caused by sharp or burning objects.

B. Warranty shall be signed by both Contractor and Subcontractor for work of this section.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Marathon Engineering Corporation. Tel: 209-754-5121.

B. Product: Gold Medal Safety Padding.

C. Substitutions and Product Options: Under provisions of Section 01 60 00 - "Product Requirements".

2.02 MATERIALS

A. Safety Padding (Match Existing):
   1. Self-adhering, resilient resinous composition surfacing material containing fire-retardant additives for use as floor, wall and door padding.
   2. Surface Burning Characteristics: Class A when tested per ASTM E84.
      a. To comply with California State Fire Marshal's Code, provide on walls and doors application, 1/8-inch thick, low-smoke neoprene coating adhered with a low smoke, non-flammable, P14 cement.
   3. Hardness Range: ASTM D2240, 45 - 50 Shore A-2.
   4. Weight: Approximately 5 pounds per square foot at 1-inch thickness.
   5. Moisture Absorption: 0.8 to 1.05 percent by weight.
   6. Compressive Properties: Compressive Strength of 6 psi at 10 percent deflection and 110.6 psi at 50 percent deflection.
   7. Compressive Set: 90 percent recovery after 72 hours.
   8. Fungus Resistance: Completely resistant.
   9. Elongation at Break: ASTM D412, 150 percent.
   10. Tensile Strength: ASTM D412, 300 psi minimum.

2.03 ACCESSORIES

A. Bond Coat for Wall Panels: Gold Medal Resilient Cell Padding bond coat, by Marathon Engineering Corporation.

B. Epoxy Filler for Wall Panels: Gold Medal Resilient Cell Padding flexible epoxy, by Marathon Engineering Corporation.

C. Wall and Door Panel Top Coating: Gold Medal Resilient Cell Padding top coating, by Marathon Engineering Corporation.

D. Fasteners: As recommended by manufacturer.

E. Substitutions and Product Options: Under provisions of Section 01 60 00 - "Product Requirements".

2.04 FINISH

A. Scuff-resistant.

B. Color: As selected by Architect.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Verify that conditions are satisfactory for installation of safety padding.

B. Do not start installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install on floors, walls and doors in detention cells as indicated, in compliance with manufacturer's installation instructions.

B. Prohibit smoking, open flames or sparking from electrical equipment during application.

C. Concrete Floors: Liquid-poured and self-leveling.
   1. Thickness: 1/2-inch.
   2. Allow minimum 60-day curing period for new concrete before application of liquid poured safety padding on floors.
   3. Apply bond coat to concrete floor to ensure compatibility with floor substrate.

D. Walls: Install as prefabricated panels on concrete masonry unit construction and on Trussbilt Metal Wall Panels.
   1. Apply padding in 1-inch nominal thick sheets on 7/16-inch oriented strand board (OSB) panels.
      a. Apply 1/2-inch thickness padding at door jambs.
   2. Mechanically attach panels to wall with 1/8-inch, plus or minus 1/16-inch, gap between panels.
      a. Use a minimum of 16 fasteners per panel.
   3. Fill fastener holes and gaps between panels with resilient cell padding flexible epoxy leaving no open seams.
   4. Sand all walls to remove all traces of seams and fasteners.

E. Apply resilient cell padding topcoat to all finish surfaces following sanding of walls and placement of liquid pour of floor padding.

F. Apply topcoat of neoprene coating to all finish wall and door surfaces to comply with California State Fire Marshal's Code.

3.03 CLEANING

A. Clean cell padding on floors and walls with mild detergent in accordance with manufacturer's recommended cleaning methods.

END OF SECTION 11 19 51

SECTION 22 05 00

PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pipe, pipe fittings, valves, and connections for piping systems.
   1. Sanitary sewer.
   2. Domestic water.

1.02 RELATED SECTIONS

A. Section 083100 - Access Doors and Panels.

B. Section 099000 - Painting and Coating.

C. Section 230548 - Vibration Isolation.

D. Section 200700 - Piping Insulation.

1.03 REFERENCES

A. ANSI Z21.22 - American National Standard for Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems; 1999, and addenda A&B (R2004).

B. ASME B16.1 - Cast Iron Pipe Flanges and Flanged Fittings; The American Society of Mechanical Engineers; 1998.

C. ASME B16.3 - Malleable Iron Threaded Fittings; The American Society of Mechanical Engineers; 1998.

D. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; The American Society of Mechanical Engineers; 2001 (R2005) (ANSI B16.18).

E. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings; The American Society of Mechanical Engineers; 2001 (R2005).

F. ASME B16.23 - Cast Copper Alloy Solder Joint Drainage Fittings - DWV; The American Society of Mechanical Engineers; 2002.

G. ASME B16.26 - Cast Copper Alloy Fittings for Flared Copper Tubes; The American Society of Mechanical Engineers; 1988.

H. ASME B16.29 - Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings - DWV; The American Society of Mechanical Engineers; 2001.

I. ASME B31.9 - Building Services Piping; The American Society of Mechanical Engineers; 2004 (ANSI/ASME B31.9).

J. ASTM A 47/A 47M - Standard Specification for Ferritic Malleable Iron Castings; 1999 (Reapproved 2004).

K. ASTM A 74 - Standard Specification for Cast Iron Soil Pipe and Fittings; 2005.

L. ASTM B 32 - Standard Specification for Solder Metal; 2004.

M. ASTM B 42 - Standard Specification for Seamless Copper Pipe, Standard Sizes; 2002.

N. ASTM B 68 - Standard Specification for Seamless Copper Tube, Bright Annealed; 2002.

O. ASTM B 75 - Standard Specification for Seamless Copper Tube; 2002.

P. ASTM B 88 - Standard Specification for Seamless Copper Water Tube; 2003.

Q. ASTM C 564 - Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings; 2003a.

R. ASTM F 708 - Standard Practice for Design and Installation of Rigid Pipe Hangers; 1992 (Reapproved 2004).

S. AWS A5.8/A5.8M - Specification for Filler Metals for Brazing and Braze Welding; American Welding Society; 2004 and errata.

T. AWWA C651 - Disinfecting Water Mains; American Water Works Association; 2005 (ANSI/AWWA C651).

U. CISPI 301 - Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste and Vent Piping Applications; Cast Iron Soil Pipe Institute; 2005.

V. CISPI 310 - Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications; Cast Iron Soil Pipe Institute; 2004.

W. MSS SP-58 - Pipe Hangers and Supports - Materials, Design and Manufacture; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; 2002.

X. MSS SP-69 - Pipe Hangers and Supports - Selection and Application; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; 2003.

Y. MSS SP-80 - Bronze Gate, Globe, Angle and Check Valves; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; 2003.

Z. MSS SP-89 - Pipe Hangers and Supports - Fabrication and Installation Practices; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; 2003.

AA. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; 1996.

1.04 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.

C. Project Record Documents: Record actual locations of valves.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with State of California, standards.
   1. Maintain one copy on project site.

B. Valves: Manufacturer's name and pressure rating marked on valve body.

C. Welding Materials and Procedures: Conform to ASME (BPV IX) and applicable state labor regulations.

D. Welders Certification: In accordance with ASME (BPV IX).

E. Identify pipe with marking including size, ASTM material classification, ASTM specification, water pressure rating.

1.06 REGULATORY REQUIREMENTS

A. Perform Work in accordance with State of California plumbing code.

B. Conform to applicable code for installation of backflow prevention devices.

C. Provide certificate of compliance from authority having jurisdiction indicating approval of installation of backflow prevention devices.

1.07 DELIVERY, STORAGE, AND PROTECTION

A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

B. Provide temporary protective coating on cast iron and steel valves.

C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Do not install underground piping when bedding is wet or frozen.

1.09 EXTRA MATERIALS

A. See Section 01600 - Project Requirements, for additional provisions.

B. Provide two repacking kits for each size valve.

PART 2 PRODUCTS

2.01 SANITARY SEWER PIPING, BURIED WITHIN 5 FEET (1500 mm) OF BUILDING

A. Cast Iron Pipe: CISPI 301, hubless, service weight.
   1. Fittings: Cast iron.
   2. Joints: CISPI 310, neoprene gaskets and stainless steel clamp-and-shield assemblies.

2.02 SANITARY SEWER PIPING, ABOVE GRADE

A. Cast Iron Pipe: CISPI 301, hubless, service weight.
   1. Fittings: Cast iron.
   2. Joints: CISPI 310, neoprene gaskets and stainless steel clamp-and-shield assemblies.

2.03 WATER PIPING, BURIED WITHIN 5 FEET (1500 mm) OF BUILDING

A. Copper Pipe: ASTM B 42, Type K hard drawn.
   1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22 wrought copper and bronze.
   2. Joints: ASTM B 32, alloy Sn95 solder.

2.04 WATER PIPING, ABOVE GRADE

A. Copper Tube: ASTM B 88 (ASTM B 88M), Type L (B), Drawn (H).
   1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
   2. Fittings: Cast iron, coated.
   3. Joints: ASTM B 32, alloy Sn95 solder.
   4. Joints: Grooved mechanical couplings.

2.05 FLANGES, UNIONS, AND COUPLINGS

A. Unions for Pipe Sizes 3 Inches (80 mm) and Under:
   1. Ferrous pipe: Class 150 malleable iron threaded unions.
   2. Copper tube and pipe: Class 150 bronze unions with soldered joints.

B. Flanges for Pipe Size Over 1 Inch (25 mm):
   1. Ferrous pipe: Class 150 malleable iron threaded or forged steel slip-on flanges; preformed neoprene gaskets.

2. Copper tube and pipe: Class 150 slip-on bronze flanges; preformed neoprene gaskets.

C. Grooved and Shouldered Pipe End Couplings:
1. Housing: Malleable iron clamps to engage and lock, designed to permit some angular deflection, contraction, and expansion; steel bolts, nuts, and washers; galvanized for galvanized pipe.
2. Sealing gasket: "C" shape composition sealing gasket.

D. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

E. Solvent Cements for Joining PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

F. Plastic, Pipe-Flange Gaskets, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.

2.06 PIPE HANGERS AND SUPPORTS

A. Plumbing Piping - Drain, Waste, and Vent:
1. Conform to ASME B31.9.
2. Hangers for Pipe Sizes 1/2 Inch (15 mm) to 1-1/2 Inches (40 mm): Malleable iron, adjustable swivel, split ring.
3. Hangers for Pipe Sizes 2 Inches (50 mm) 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 (80 mm): Cast iron hook.
6. Wall Support for Pipe Sizes 4 Inches (100 mm) and Over: Welded steel bracket and wrought steel clamp.
7. Vertical Support: Steel riser clamp.
8. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
9. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

B. Plumbing Piping - Water:
1. Conform to ASME B31.9.
2. Hangers for Pipe Sizes 1/2 Inch (15 mm) to 1-1/2 Inches (40 mm): Malleable iron, adjustable swivel, split ring.
3. Hangers for Cold Pipe Sizes 2 Inches (50 mm) and Over: Carbon steel, adjustable, clevis.
4. Hangers for Hot Pipe Sizes 2 Inches (50 mm) to 4 Inches (100 mm): Carbon steel, adjustable, clevis.
5. Hangers for Hot Pipe Sizes 6 Inches (150 mm) and Over: Adjustable steel yoke, cast iron pipe roll, double hanger.
6. Multiple or Trapeze Hangers: Steel channels with welded supports or spacers and hanger rods.
7. Multiple or Trapeze Hangers for Hot Pipe Sizes 6 Inches (150 mm) and Over: Steel channels with welded supports or spacers and hanger rods, cast iron roll.
8. Wall Support for Pipe Sizes to 3 Inches (80 mm): Cast iron hook.
9. Wall Support for Pipe Sizes 4 Inches (100 mm) and Over: Welded steel bracket and wrought steel clamp.
10. Wall Support for Hot Pipe Sizes 6 Inches (150 mm) and Over: Welded steel bracket and wrought steel clamp with adjustable steel yoke and cast iron pipe roll.
11. Vertical Support: Steel riser clamp.
12. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
13. Floor Support for Hot Pipe Sizes to 4 Inches (100 mm): Cast iron adjustable pipe saddle,

locknut, nipple, floor flange, and concrete pier or steel support.

14. Floor Support for Hot Pipe Sizes 6 Inches (150 mm) and Over: Adjustable cast iron pipe roll and stand, steel screws, and concrete pier or steel support.
15. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

2.07 BALL VALVES

A. Manufacturers:
   1. Conbraco Industries: www.conbraco.com.
   2. Nibco, Inc: www.nibco.com.
   3. Milwaukee Valve Company: www.milwaukeevalve.com.

B. Construction, 4 Inches (100 mm) and Smaller: MSS SP-110, Class 150, bronze, two piece body, chrome plated brass ball, full port, teflon seats and stuffing box ring, blow-out proof stem, lever handle, solder ends with union.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that excavations are to required grade, dry, and not over-excavated.

3.02 PREPARATION

A. Ream pipe and tube ends. Remove burrs.

B. Remove scale and dirt, on inside and outside, before assembly.

C. Prepare piping connections to equipment with flanges or unions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.

C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.

D. Install piping to maintain headroom, conserve space, and not interfere with use of space.

E. Group piping whenever practical at common elevations.

F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

G. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings

H. Provide access where valves and fittings are not exposed. Coordinate size and location of access doors with architect.

I. Install vent piping penetrating roofed areas to maintain integrity of roof assembly.

J. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.

K. Prepare exposed, unfinished pipe, fittings, supports, and accessories ready for finish painting.

L. Install bell and spigot pipe with bell end upstream.

M. Install valves with stems upright or horizontal, not inverted.

O. Install water piping to ASME B31.9.

P. Sleeve pipes passing through partitions, walls and floors.

Q. Inserts:
1. Provide inserts for placement in concrete formwork.
2. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches (100 mm).
4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.

R. Pipe Hangers and Supports:
1. Install in accordance with ASME B31.9.
2. Support horizontal piping as scheduled.
3. Install hangers to provide minimum 1/2 inch (15 mm) space between finished covering and adjacent work.
4. Place hangers within 12 inches (300 mm) of each horizontal elbow.
5. Use hangers with 1-1/2 inch (40 mm) minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
6. Support vertical piping at every floor. Support riser piping independently of connected horizontal piping.
7. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
8. Prime coat exposed steel hangers and supports. Refer to Section 09900. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
9. Provide hangers adjacent to motor driven equipment with vibration isolation.
10. Support cast iron drainage piping at every joint.

3.04 APPLICATION

A. Use grooved mechanical couplings and fasteners only in accessible locations.

B. Install unions downstream of valves and at equipment or apparatus connections.

C. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.

D. Install ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.

E. Install ball valves for throttling, bypass, or manual flow control services.

3.05 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. Disinfect water distribution system in accordance with Section 02515.

B. Prior to starting work, verify system is complete, flushed and clean.

C. Ensure Ph of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).

D. Inject disinfectant, free chlorine in liquid, powder, tablet or gas form, throughout system to obtain 50 to 80 mg/L residual.

E. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.

F. Maintain disinfectant in system for 24 hours.

G. If final disinfectant residual tests less than 25 mg/L, repeat treatment.

H. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.

I. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

3.06 SCHEDULES

A. Pipe Hanger Spacing:
   1. Metal Piping:
      a. Pipe size: 1/2 inches (15 mm) to 1-1/4 inches (32 mm):
         1) Maximum hanger spacing: 6.5 ft (2 m).
         2) Hanger rod diameter: 3/8 inches (9 mm).
      b. Pipe size: 1-1/2 inches (40 mm) to 2 inches (50 mm):
         1) Maximum hanger spacing: 10 ft (3 m).
         2) Hanger rod diameter: 3/8 inch (9 mm).
      c. Pipe size: 2-1/2 inches (65 mm) to 3 inches (75 mm):
         1) Maximum hanger spacing: 10 ft (3 m).
         2) Hanger rod diameter: 1/2 inch (13 mm).
      d. Pipe size: 4 inches (100 mm) to 6 inches (150 mm):
         1) Maximum hanger spacing: 10 ft (3 m).
         2) Hanger rod diameter: 5/8 inch (15 mm).

END OF SECTION

SECTION 22 10 00

PLUMBING SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cleanouts.

1.02 RELATED SECTIONS

A. Section 221000 - Plumbing Piping.

B. Section 224000 - Plumbing Fixtures.

C. Section 223000 - Plumbing Equipment.

D. Section 260519 - Equipment Wiring: Electrical characteristics and wiring connections.

1.03 REFERENCES

A. ASME A112.6.3 - Floor and Trench Drains; The American Society of Mechanical Engineers; 2001.

B. ASME A112.6.4 - Roof, Deck, and Balcony Drains; The American Society of Mechanical Engineers; 2003.

C. ASSE 1011 - Hose Connection Vacuum Breakers; American Society of Sanitary Engineering; 2004 (ANSI/ASSE 1011).

D. ASSE 1019 - Vacuum Breaker Wall Hydrants, Freeze Resistant Automatic Draining Type; American Society of Sanitary Engineering; 2004 (ANSI/ASSE 1019).

E. ASTM C 478 - Standard Specification for Precast Reinforced Concrete Manhole Sections; 2006a.

F. ASTM C 478M - Standard Specification for Precast Reinforced Concrete Manhole Sections (Metric); 2006a.

G. PDI-WH 201 - Water Hammer Arresters; Plumbing and Drainage Institute; 2006.

1.04 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.

C. Shop Drawings: Indicate dimensions, weights, and placement of openings and holes.

D. Certificates: Certify that oil interceptors meet or exceed specified requirements.

E. Manufacturer's Instructions: Indicate Manufacturer's Installation Instructions: Indicate assembly and support requirements.

F. Project Record Documents: Record actual locations of equipment, cleanouts, backflow preventers, water hammer arrestors trap primers, tempering valves.

G. Operation Data: Indicate frequency of treatment required for interceptors.

H. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years documented experience.

1.06 DELIVERY, STORAGE, AND PROTECTION

A. Accept specialties on site in original factory packaging. Inspect for damage.

1.07 EXTRA MATERIALS

A. See Section 01600 - Product Requirements, for additional provisions.

B. Supply use in maintenance of project:
   1. Two loose keys for outside hose bibbs.

PART 2 PRODUCTS

2.01 CLEANOUTS

A. Manufacturers:
   1. Jay R. Smith Manufacturing Company: www.jayrsmith.com.
   2. Josam Company: www.josam.com.
   3. Zurn Industries, Inc: www.zurn.com.

B. Cleanouts at Exterior Surfaced Areas (CO-1):
   1. Round cast nickel bronze access frame and non-skid cover.

C. Cleanouts at Exterior Unsurfaced Areas (CO-2):
   1. Line type with lacquered cast iron body and round epoxy coated gasketed cover.

D. Cleanouts at Interior Finished Floor Areas (CO-3):
   1. Galvanized cast iron body with anchor flange, reversible clamping collar, threaded top assembly, and round gasketed scored cover in service areas and round gasketed depressed cover to accept floor finish in finished floor areas.

E. Cleanouts at Interior Finished Wall Areas (CO-4):
   1. Line type with lacquered cast iron body and round epoxy coated gasketed cover, and round stainless steel access cover secured with machine screw.

F. Cleanouts at Interior Unfinished Accessible Areas (CO-5): Calked or threaded type. Provide bolted stack cleanouts on vertical rainwater leaders.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanout for rodding of drainage system.

C. Encase exterior cleanouts in concrete flush with grade.

D. Install floor cleanouts at elevation to accommodate finished floor.

E. Install approved potable water protection devices on plumbing lines where contamination of domestic water may occur; on boiler feed water lines, janitor rooms, fire sprinkler systems, premise isolation, irrigation systems, flush valves, interior and exterior hose bibs.

F. Install water hammer arrestors complete with accessible isolation valve on hot and cold water supply piping to fixtures indicated on drawings.

END OF SECTION

SECTION 22 40 00

PLUMBING FIXTURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Water closets.

1.02 RELATED SECTIONS

A. Section 070 00 – Thermal and Moisture Protection.

B. Section 221000 - Plumbing Piping.

C. Section 220500 - Plumbing Specialties.

D. Section 223000 - Plumbing Equipment.

1.03 REFERENCES

A. ASME A112.6.1M - Supports for Off-the-Floor Plumbing Fixtures for Public Use; The American Society of Mechanical Engineers; 1997 (Reaffirmed 2002).

B. ASME A112.18.1 - Plumbing Supply Fittings; The American Society of Mechanical Engineers; 2005.

C. ASME A112.19.1M - Enameled Cast Iron Plumbing Fixtures; The American Society of Mechanical Engineers; 1994 (R2004).

D. ASME A112.19.2 - Vitreous China Plumbing Fixtures and Hydraulic Requirements for Water Closets and Urinals; The American Society of Mechanical Engineers; 2003.

E. ASME A112.19.3 - Stainless Steel Plumbing Fixtures (Designed for Residential Use); The American Society of Mechanical Engineers; 2000 (R2004).

F. ASME A112.19.4M - Porcelain Enameled Formed Steel Plumbing Fixtures; The American Society of Mechanical Engineers; 1994 (R2004).

G. ASME A112.19.5 - Trim for Water-Closet Bowls, Tanks and Urinals; The American Society of Mechanical Engineers; 2005.

1.04 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.

C. Manufacturer's Instructions: Indicate installation methods and procedures.

D. Maintenance Data: Include fixture trim exploded view and replacement parts lists.

E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

1.06 REGULATORY REQUIREMENTS

A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

1.07 DELIVERY, STORAGE, AND PROTECTION

A. Accept fixtures on site in factory packaging. Inspect for damage.

B. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

1.08 WARRANTY

A. See Section 01770 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 FLUSH VALVE SECURITY WATER CLOSETS

A. Bowl:
   1. Manufacturers:
      a. Acorn Engineering: www.acorneng.com.
      b. Bradley Corporation: www.bradleycorp.com
      c. Metcraft Industries: www.metcraftindustries.com

   2. ASME A112.19.2; detox floor mount, blowout jet stainless steel closet bowl, with washout rim, bar grate with tamper proof screws.

B. Flush Valve:
   1. Manufacturers:
      a. Sloan Valve Company: www.sloanvalve.com.
      b. Zurn Industries: www.zurn.com.
   2. 1.6 GPM, remote flush electrical button, 125 psig (860 kPa), integral check stop and backflow-prevention device, brass body with corrosion-resistant components. exposed chrome plated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that walls and floor finishes are prepared and ready for installation of fixtures.

3.02 PREPARATION

A. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures.

3.03 INSTALLATION

A. Install each fixture with trap, easily removable for servicing and cleaning.

B. Provide chrome plated rigid or flexible supplies to fixtures with loose key stops, reducers, and escutcheons.

C. Install components level and plumb.

D. Install and secure fixtures in place with wall supports and bolts.

E. Seal fixtures to wall and floor surfaces with sealant as specified in Section 07900, color to match fixture.

F. Solidly attach water closets to floor with lag screws. Lead flashing is not intended hold fixture in

place.

3.04 INTERFACE WITH WORK OF OTHER SECTIONS

A. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough-in and installation.

3.05 ADJUSTING

A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

3.06 CLEANING AND PROTECTION

A. Clean plumbing fixtures and equipment.

B. Do not permit use of fixtures.

END OF SECTION

SECTION 23 00 00

BASIC MECHANICAL REQUIREMENTS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. The General conditions, supplementary conditions, special Requirements, and applicable portions of Division 1 of the specification are a part of this Division and the requirements contained herein are supplementary to them.

B. This Division is an integrated whole comprising interrelated and interdependent sections and shall be considered in its entirety in determining requirements.

C. Refer to other sections of this Division for additional requirements or information regarding the subjects of this Section.

1.02 ABBREVIATIONS AND DEFINITIONS (as used on Division 23 Drawings and herein)

A. This Division is abbreviated and includes incomplete sentences. Supply omitted words by inference.

B. Symbols: "S" means submittals are required; "[M/O]" means Maintenance/Operating data is required; see paragraphs hereinafter.

C. "Provide" means furnish, install and connect unless otherwise described in specific instances.

D. "Piping" means pipes, fittings, valves and all like pipe accessories connected thereto.

E. "Ductwork" means ducts, plenums, compartments, casings or any like devices, including the building structure, which are used to convey or contain air.

F. "Extend", "Submit", "Repair", "Abandon", "Replace", "Remove" and similar words mean that the Contractor (or his designated subcontractor) shall accomplish the action described.

G. "Codes" or "Code" means all codes, laws, statutes, rules, regulations, ordinances, orders, decrees, and other requirements of all legally constructed authorities and public utility franchise holders having jurisdiction.

H. "Products", "Materials" and "Equipment" are used interchangeably and mean materials, fixtures, equipment, accessories, etc.

I. "Utility Areas" are defined as mechanical, electrical, janitorial, and similar rooms or spaces which are normally used or occupied only by custodial or maintenance personnel. "Public Areas" are defined as the rooms or spaces which are not included in the utility areas definition.

J. "Building Boundary" includes concrete walkways immediately adjacent to the building structure.

K. "Below Grade" means buried in the ground.

L. "Substantial Mechanical Completion" means all components of all systems are functioning but lacking in final adjustment.

M. Pressure rating specified (such as for valves and the like) means design working pressure for and with references to the fluid which the device will serve.

1.03 DESCRIPTION

A. Provide a complete and operable installation, including all labor, supervision, materials, equipment, tools, apparatus, transportation, warehousing, rigging, scaffolding and other equipment and services necessary to accomplish the work in accordance with the intent and meaning of these drawings and specifications.

1.04 RELATED WORK

A. Coordination: Refer to Architectural, Civil, Structural, and Electrical Drawings for the construction details and coordinate the work of this Division with that of other Divisions. Order the work of this Division so that progress will harmonize with that of other Divisions and all work will proceed expeditiously. The work of this Division shall include direct responsibility for the correct placing and connection of mechanical work in relation to the work of other Divisions.

B. Examine other Divisions for work related to the work of this Division especially Division 26 - ELECTRICAL.

1.05 EXISTING CONDITIONS

A. Visit the site prior to bidding and investigate the existing conditions which affect or will be affected by the work of this Division. Become thoroughly familiar with the working conditions and take into account any special or unusual features peculiar to this job. By the act of submitting a Bid, the Contractor will be deemed to have complied with the forgoing, to have accepted such conditions, and to have made allowance therefore in preparing his Bid.

B. The location of existing concealed utility lines are shown in accordance with reference data received by the Architect. The Architect does not guarantee the accuracy of such data. The points of connection are therefore approximate and the Bidder shall include adequate funds in his bid to cover costs of connection regardless of their exact location.

C. Exercise extreme caution during trenching operations. Repair the damage caused by such operations to existing utility lines at no cost to the Owner, whether the lines are shown on drawings or not.

1.06 DRAWINGS AND SPECIFICATIONS

A. Drawings and specifications are intended to complement each other. Where a conflict exists between the requirements of the drawings and/or the specifications, request clarification.

B. The Architect shall interpret the drawings and the specifications, and his decision as to the true intent and meaning thereof and the quality, quantity, and sufficiency of the materials and workmanship furnished there under shall be accepted as final and conclusive.

C. In case of conflict not clarified prior to Bidding deadline, use the most costly alternative (better quality, greater quantity, or larger size) in preparing the Bid. A clarification will be issued to the successful bidder as soon as feasible after the Award and if appropriate a deductive change order will be issued.

D. All provisions shall be deemed mandatory except as expressly indicated as optional by the word "may" or "option".

1.07 NOT APPLICABLE

1.08 PERMITS AND INSPECTIONS

A. Obtain, schedule and pay for permits, licenses, approvals, tests, and inspections required by legally constituted authorities and public utility franchise holders having jurisdiction over the work.

B. Afford the Architect's representative every facility for evaluating the skill and competence of the mechanics and to examine the materials. Concealed work shall be reopened when so directed during his periodic visits.

1.09 CODES AND REGULATIONS

A. By submitting a bid, Contractor is deemed to represent himself as competent to accomplish the work of this Division in conformance with applicable Codes. In case of conflict between the Contract documents and the Code requirements, the Codes shall take precedence. Should such conflicts appear, cease work on the parts of the contract affected and immediately notify the Architect in writing. It shall be the Contractor's responsibility to correct, at no cost to the Owner, any work he executes in violation of Code requirements. Specify references to codes elsewhere in this Division are either to aid the Contractor in locating applicable information or to deny him permission to use options which are permitted by Codes.

B. Applicable Codes: (Current editions unless otherwise noted)
   1. All local codes; city and/or County as applicable
   2. OSHA requirements
   3. Uniform Building Code
   4. Uniform Mechanical Code
   5. Uniform Plumbing Code
   6. California Code of Regulations (CCR) Titles
   7. Fire Marshal Regulations
   8. Regulations of all other authorities having jurisdiction.

C. Where conflict or variation exists among codes, the most stringent shall govern.

D. Certificates of Conformance or Compliance: Submit original and not pre-printed certifications. Do not make statements in the certifications that could be interpreted to imply that the product does not meet all requirements specified, such as "as good as", "achieve the same end use and results as materials formulated in accordance with the referenced publications", "equal or exceed the services and performance of the specified material". Simply state that the product conforms to the requirements specified.

E. Certified Test Reports: Certified Test Reports are reports of tests conducted on previously manufactured materials or equipment identical to that proposed for use. Before delivery of materials and equipment, submit certified copies of test reports specified in the individual sections.

F. Factory Tests: Factory tests are tests which are required to be performed on the actual materials or equipment proposed for use. Submit results of the tests in accordance with the requirements for laboratory test results of this Contract.

G. Permits and Certificates of Inspection: Furnish the originals.

H. Testing procedures and test results required in this and other sections. Furnish 2 copies.

I. Other data required by other sections of this Division. Furnish 2 copies.

1.10 RECORD AND DOCUMENTATION

A. Accumulate the following and deliver to the Owner's representative prior to final acceptance of the work:
   1. Record (As-Built) Drawings:
      a. Maintain in good order in the field office a complete set of prints for all work being done under Division 23. Update the drawings daily with neat and legible annotations in red ink showing the work as actually installed.
      b. The actual size, location and elevation of all buried lines, valve boxes, manholes, monuments, and stub-outs shall be accurately located and dimensioned from building walls or other permanent landmarks.
      c. Furnish the originals.
   2. Operation and Maintenance Manual: Furnish an operation and maintenance manual

covering the stipulated mechanical systems and equipment. Seven copies of the manual, bound in hardback binders or an approved equivalent, shall be provided to the Architect in accordance with the Division 1 section on Maintenance and Operation Manuals. Furnish one complete manual prior to the time that system or equipment tests are performed. Furnish the remaining manuals before the contract is completed. The following identification shall be inscribed on the cover:
OPERATION AND MAINTENANCE MANUAL
PROJECT TITLE.....
CONTRACTOR.....
Provide a table of contents. Insert tab sheets to identify discrete subjects. Instruction sheets shall be legible and easily understood, with large sheets of drawings folded in. The manual shall be complete in all respects for all materials, piping, valves, devices and equipment, controls, accessories and appurtenances stipulated. Include as a minimum the following:

a. Updated approved materials list, shop drawings and catalog information of all items indicated by symbol "M/O" at titles or beginning of paragraphs.
b. System layout showing piping, valves and controls.
c. Wiring and control diagrams with data to explain detailed operation and control of each component.
d. A control sequence describing start-up, operation and shutdown.
e. Detailed description of the function of each principal component of the system.
f. Procedure for starting.
g. Procedure for operation.
h. Shut-down instruction.
i. Installation instructions.
j. Adjustments, maintenance and overhaul instructions.
k. Lubrication schedule including type, grade, temperature range and frequency.
l. Safety precautions, diagrams and illustrations.
m. Test procedures.
n. Performance data.
o. Parts lists, with manufacturer's names and catalog numbers.
p. Preventive maintenance schedule.
q. Service organization with name, address and telephone number.
r. Valve identification chart and schedule.
s. ASME certification
t. Air Balance report.
u. Hydronic Balance report.

B. Standard Compliance: Where equipment or materials are specified to conform with requirements of standards of recognized technical or industrial organizations such as American National Standards (ANSI), American Society of Mechanical Engineers (ASME), American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), Underwriters Laboratories (UL), American Refrigeration Institute (ARI), American Gas Association (AGA), or National Electrical Manufacturer's Association (NEMA), that use a label or published listing as a method of indicating compliance, proof of such conformance shall be submitted and approved. The label or listing of the specified organization will be acceptable evidence.

C. Certificates of Conformance or Compliance: Submit original and not pre-printed certifications. Do not make statements in the certifications that could be interpreted to imply that the product does not meet all requirements specified, such as "as good as", "achieve the same end use and results as materials formulated in accordance with the referenced publications", "equal or exceed the services and performance of the specified material". Simply state that the product conforms to the requirements specified.

D. Certified Test Reports: Certified Test Reports are reports of tests conducted on previously manufactured materials or equipment identical to that proposed for use. Before delivery of materials and equipment, submit certified copies of test reports specified in the individual sections.

E. Factory Tests: Factory tests are tests which are required to be performed on the actual materials or equipment proposed for use. Submit results of the tests in accordance with the requirements for laboratory test results of this Contract.

F. Permits and Certificates of Inspection: Furnish the originals.

G. Testing procedures and test results required in this and other sections. Furnish 2 copies.

H. Other data required by other sections of this Division. Furnish 2 copies.

1.11 TOOLS

A. Provide all special tools needed for proper operation and routine adjustment and maintenance of systems and equipment. Deliver tools to Owner's representative and request a receipt for same.

1.12 CONSTRUCTION COST BREAKDOWN

A. To assist the Architect and Engineer in evaluation of the construction cost, the Contractor shall prepare and submit for review a construction cost breakdown for the major subdivisions of the mechanical work.

B. Subdivide each item on the breakdown into two headings: labor and materials. Include overhead and profit in each entry.

C. Cost breakdowns shall be submitted and approved prior to the first payment request. Send one copy of the breakdown directly to the Engineer and the remaining copies sent through regular channels.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Standard Products: Materials and equipment shall be essentially the standard cataloged products of manufacturers regularly engaged in production of such materials or equipment and shall be their latest standard designs that comply with the specification requirements. Materials and equipment shall duplicate items that have been in satisfactory commercial or industrial use at least two years prior to bid opening. Where two or more units of the same type of equipment are required, these units shall be products of a single manufacturer. The components thereof, however, are not required to be exclusively of the same manufacturer. Each major component of equipment shall have manufacturer's name, address, model, and serial number on a nameplate securely affixed in a conspicuous place. The nameplate of the distributing agent will not be acceptable.

B. Whenever on the plans, or in these specifications, products are identified by the name of one manufacturer, it is intended that equivalent products of other manufacturers are acceptable, unless otherwise indicated, if accepted as a substitution by the Architect. Where three or more manufacturers are listed as "acceptable manufacturers" however, then the products furnished shall be the product of one of the manufacturers listed. Manufacturers listed as "acceptable manufacturers" shall meet quality and performance of a particular one specified by both name and catalog number.

2.02 SUBSTITUTIONS

A. General: Should the Contractor desire to substitute for specified products, he shall submit with the Material List a complete list of the requested substitutions. The request shall contain complete descriptive information of the products. Samples for evaluation shall also be submitted upon the Architect's request. If in the Architect's opinion the products as presented in this first submittal are in variance with the specified products, or if the information submitted is not sufficiently complete to allow proper evaluation, the substitution will be disallowed from consideration and the specified products shall be furnished. By proposing a substitution, it is deemed that the Contractor shall

bear the cost of any changes (whether architectural, structural, electrical or mechanical) necessary to accommodate the substitution.

B. Specific: Refer to other sections of this Division for additional requirements.

2.03 SUBMITTALS

A. General:

1. Provide for all items indicated with the symbol "[S]" at titles or beginning of paragraphs in accordance with the Division 1 section covering submittals and as herein specified. Where warranty of longer than one year is specified, include such warranty with submittal. Architect's review of the submittal is only for general conformance with design compliance with the information given in the contract documents. The submittal procedure is required as an effort to minimize the problems which occur due to the discovery of Contractor non-compliance at the construction site. The Contractor is responsible for conformation and correlation of the dimensions, quantities and sizes, for information that pertains to fabrication methods or construction techniques, and for coordination of work of all Divisions of the work. Deviations, if any, from Contract documents shall be clearly and completely indicated (by a separate letter if deviations are extensive) in the submittals, and the lack of such is deemed complete compliance with Contract Documents without any deviations. Submittals favorably processed will not relieve the Contractor of responsibility for deviations not so reported nor for errors in the submittal.
2. In addition to the above, upon permission to proceed after review of submittal and prior to the installation of work, submit dimensioned and scaled drawings (not less than 1/4-inch equal to one foot) of all mechanical equipment rooms and areas. Such layouts shall indicate, but not be limited to, all mechanical equipment, control panels, piping, housekeeping pads, ductwork, tube pull, access and maintenance clearances, and other like items. The layout shall also indicate major equipment to be provided under other Sections of work.
3. Contractor Stamp: All submittals shall be stamped with the following text and signed by the Contractors representative:

   "IT IS HEREBY CERTIFIED THAT THE PRODUCTS SHOWN AND MARKED IN THIS SUBMITTAL ARE IN COMPLIANCE WITH THE CONTRACT DOCUMENTS AND CAN BE INSTALLED IN THE ALLOCATED SPACES EXCEPT WHERE NOTED AS DEVIATIONS. CERTIFIED BY:---------- DATE:---------

4. All submittals shall be complete and with catalog data and information properly marked to show, among other things, equality of material (where substitution is allowed and desired), adequacy in capacity and performance to meet minimum capacities of performance as specified or indicated. Arrange the submittals in the same sequence as these specifications, and reference (at the upper right-hand corner) the particular specification provision for which each submittal is intended. Incomplete submittals will be rejected.
5. For all work under Division 23, the notations by the Contractor or Supplier on submittal documents "Per Plans and Specifications", or "As Specified", or similar wording or phrasing is not acceptable and will be cause of rejection. Complete descriptive submittals are required for all Division 23 work.
6. Refer to the other sections of this Division for specific requirements.

B. Material List: Within 15 days after award of Contract, submit for approval a complete list of materials proposed for use. Furnish names and addresses of manufacturers, catalog numbers (where applicable) types and trade names. For purposes of uniformity, only one manufacturer will be accepted for each class or type of material. This list is in addition to Shop Drawings.

C. Shop Drawings: Submit shop drawings with such promptness as to cause no delay in the work. Do not commence fabrication of the equipment until the approved drawings are received from the Owner's representative.

D. Other Submittals: As required by other sections of this Division.

PART 3 EXECUTION

3.01 WORKMANSHIP AND INSTALLATION METHODS

A. Workmanship shall be in the best standard practice of the trade.

B. Execute the work so as to contribute to ease of operation and maintenance, maximum accessibility and best appearance. Execute it so that the installation will conform and adjust itself to the building structure, its equipment and its usage. The work shall be symmetrical, plumb, uniform, properly aligned, and firmly secured in place.

C. Install equipment in accordance with the manufacturer's instructions and recommendations unless otherwise noted or specified.

3.02 TESTS

A. General:
   1. Demonstrate that all components of the work of this Division have been provided and that they operate in accordance with the Contract Documents.
   2. Provide instruments and personnel for tests and demonstrations. Submit signed test results.

B. Specific: Refer to the other sections of this Division for test requirements.

3.03 DELIVERY, HANDLING, STORAGE OF MATERIALS AND PROTECTION OF WORK

A. Protect materials against dirt, water, chemical and mechanical damage both while in storage and during construction.

B. Cover materials in such a manner that no finished surfaces will be damaged, marred or splattered with plaster or paint and all moving parts will be kept clean and dry.

C. Replace or refinish any damaged materials including fronts of control panels, ductwork fittings, and shop fabricated ductwork.

D. Keep cabinets and other openings closed to prevent entry of foreign matter.

3.04 CLEANUP AND HOUSEKEEPING

A. Cleaning shall be done as the work proceeds. Periodically remove waste and debris to keep the site as clean as is practical.

B. Leave exposed parts of the mechanical work in a neat, clean and usable condition, with painted surfaces unblemished and plated metal surfaces polished.

3.05 PROJECT CONDITIONS

A. Site Examinations and Conditions:
   1. Regard information relative to existing conditions, services and structure as approximate only. Verify dimensions and locations, and be knowledgeable of all working conditions before submitting Bid. Verify pressure, location, size, and elevation of existing services (to which points of connection are to be made or crossed) as soon as possible and prior to commencement of any new work.
   2. Make minor deviations necessary to conform with actual locations and conditions. Submission of Bid presumes proper examination of Site, locations, dimensions and conditions, and no additional cost will be honored for lack of such examinations.

B. Existing Services: Examine the Contract Drawings and visit the project site to ascertain the extent of the existing services. Where existing equipment/services serving existing structures and/or existing structures to be demolished are to remain in service, reroute, relocate, or extend such existing equipment and/or services to accommodate this project without additional cost.

C. Interruption of Existing Services: Where it is necessary to reroute existing services or utilities, or to make connections of new work to existing services or utilities, give timely written notice of such intent to the Owner and secure written approval before proceeding. Make all such interruptions at such time as permitted by the Owner. Anticipate such interruptions to be made outside of normal working hours or normal working days; therefore, no additional cost will be permitted for such work. Except in a case of emergency involving life, limb or health, do not operate any existing equipment (including valves). Where such operations are necessary, they shall be performed by the Owner's personnel.

D. Access and Placement of Work:
   1. Check and coordinate for clearance, accessibility and placement of equipment either by going through openings provided or by placing equipment during construction. Ordering of equipment to be shipped, disassembled, or disassembly of equipment at Project Site and re-assembly of equipment to accomplish this requirement shall be executed without additional cost. Where provided openings are inadequate to accommodate equipment, provide new openings and restoration of same, all at no additional cost. Obtain written approval for new openings before proceeding.
   2. Verify location of all plumbing fixtures and equipment within finished spaces with the Architectural Drawings. In the event that Mechanical Drawings do not indicate exact locations, or are in conflict with the Architectural Drawings, obtain information regarding proper locations. Installation of work without proper instruction under such circumstances will result in relocation of work, when directed, without additional cost.

E. Verification and Coordination: Drawings indicating suggested distribution routes are diagrammatic only, and all scaled and figured dimensions are approximate and are indicated for estimating purposes only. The Drawings do not indicate necessary offsets and like items. Do not construe Contract Drawings as fabrication drawings. Prior to fabrication and installation of work, verify all dimensions, sizes and distribution routes with actual conditions, and prepare submittal and fabrication drawings. Coordinate to avoid possible conflicts and resolve same where such exist. Install work to conform to structure, avoid obstruction, preserve headroom, and keep openings and passageway clear. Changes necessary, resulting from such verifications and coordinations, shall not be a cause for additional cost.

F. See Drawings for extent of demolition.

3.06 WARRANTY

A. Guarantee, in writing, all work against fault of any product or workmanship for a period of not less than one year after formal acceptance by the Owner; except, where longer periods are specified in the Specifications, such longer periods shall govern. However, when any component fails at any time during this period, the warranty period for such component and all other components that are inactive because of said failure shall be suspended. The warranty period for such component shall resume to run for the remaining portion of the warranty period when failed component is completely repaired and in operation; however, in no case shall the resumed portion of the warranty period be less than 3 months in duration.

B. Neither payments for work, nor total or partial occupancy of work by the Owner, within or prior to the warranty period specified, shall be construed as acceptance of faulty work or shall condone any negligence of omission of Contractor in doing the work.

3.07 SAFETY REQUIREMENTS

A. Enclose and guard belts, pulleys, chains, gears, couplings, projecting setscrews, keys and other rotating parts in accordance with the OSHA 1910.219. Insulate, guard, and cover any high-temperature equipment and piping so located as to endanger personnel or creature a fire hazard.

3.08 MANUFACTURER'S RECOMMENDATIONS

A. Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material or equipment being installed, furnish printed

copies of these recommendations to the installing Contractor and Architect prior to installation. Do not proceed with the installation of the item until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

END OF SECTION

SECTION 23 05 00

BASIC MECHANICAL MATERIALS AND METHODS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

A. The contract documents shall apply in their entirety to the work specified herein.

B. Submittals: Submit shop drawings and manufacturer's data on each item marked [S] in accordance with the Division 1 section on submittals and Section 23 00 00, Basic Mechanical Requirements.

C. Maintenance and Operation Manuals: Provide manufacturer's maintenance and operation manuals on each item marked [M/O] in accordance with the Division 1 section on maintenance and operation manuals and Section 23 00 00, Basic Mechanical Requirements.

PART 2 PRODUCTS

2.01 DIELECTRIC UNIONS [S]

A. Dielectric unions or flanged unions: constructed so that two pipes being connected are completely insulated (including bolt sleeves and washers) from each other with no metal-to-metal contact; EPCO or approved equivalent.

B. Unions shall have a water-impervious insulation barrier capable of limiting galvanic current to 1 percent of the short-circuit current in a corresponding bimetallic joint and, when dry, shall also be able to withstand a 600-volt breakdown test.

2.02 PRESSURE AND TEMPERATURE TEST PLUGS [S]

A. Brass body and gasketed cap, 1/4-inch mpt fitting to receive either a temperature or pressure probe 1/8-inch O.D. with neoprene (max. 200 degrees F) at 500 psi or nordel (max. 275 degrees F) at 500 psi valve core; "Pete's Plug" or approved equivalent.

2.03 PIPING SUPPORTS [S]

A. See Section 15072 Vibration Isolation regarding structural supports in compliance with seismic requirements; supports shall be as specified therein. Unless otherwise indicated or superseded by cited seismic requirements, pipe hangers and supports as follows:

B. Pipe Hangers: Carbon steel hanger with plain (black) or galvanized finish.
   1. Piping 5-inches or smaller: Conforms to Manufacturer's Standardization Society (MSS) SP-58, Type 5 hangers; Kin-Line 450 or approved equivalent.
   2. Hangers for copper piping shall be furnished with a processed felt lining; Kin-Line 450F or approved equivalent.

C. Pipe Clamps: Carbon steel with plain (black) or galvanized finish. Provide with copper finish for use on copper piping.
   1. For Vertical Piping: Conforms to MSS SP-58, Type 8; Kin-Line 470 or approved equivalent.
   2. For Horizontal Piping and Framing Channels: Short clamp (strap) for channel mounting; Kin-Line 477 or approved equivalent.

D. U-Bolts: Carbon steel U-bolt with plain (black) or galvanized finish and four finished hex nuts; conforms to MSS SP-58 type 24; Kin-Line 438 or approved equivalent.

E. Pipe Anchor Chair: Unit consisting of a carbon steel, notched, HR channel; U-bolt; and hex nuts; Kin-Line 438, or approved equivalent. (no known equivalent)

F. Pipe Anchors:
   1. Welded Tee Pipe Anchor, for piping 3-inches to 6-inches: Steel, welded, tee-shaped

anchor; Pipe Shields Model C1000, or approved equivalent (no known equivalent).

G. Trapeze Hangers: Trapeze hangers for piping shall be used where indicated or required and shall be fabricated in accordance with SMACNA Seismic Restraint Guide, latest edition.

H. Support Channels: 1-5/8-inch by 1-5/8-inch, 12 gauge steel channel. Single channel: Superstrut A-1200, or approved equivalent. Double channel: Superstrut A-1202, or approved equivalent.

I. Hanger Rods: Solid mild steel, sizes as specified below.

Pipe Size	Rod Diameter
1/2-inch through 2-inches	3/8-inch
2-1/2-inches through 3-1/2 inches	1/2-inch
4-inches and 5-inches	5/8-inch

J. Sound and Electrolysis Isolators: Provide sound and electrolysis isolators at all hangers and supports for un-insulated piping and on other piping where incompatible metals would contact each other. Isolators shall be factory fabricated, hinged, cadmium plated steel shell with processed, non-conducting hair felt isolating pad permanently attached with adhesive; Stoneman "Trisolators", or approved equivalent.
   1. Option: Piping isolators for bare un-insulated piping can be integral part of the pipe hanger.

K. Connection of Hangers to Structure: Factory fabricated steel devices or other equal suitable steel inserts, clamps, and brackets as required, Devices shall comply to MSS-SP-58.

2.04 PIPE INSULATION INSERTS [S]

A. All insulated piping 2-inches and larger shall be provided with pipe insulation inserts with steel jackets at all pipe hangers and supports.

B. Pipe Insulation Inserts: Insert shall consist of a galvanized steel jacket, minimum of 26 gauge to 16 gauge thickness depending on pipe size, and a waterproofed calcium silicate insulation insert impregnated with a fire resistive vapor barrier compound; insert thickness shall match the thickness of the specified insulation and shall extend a maximum of 1-inch beyond sheet metal; pipe Shields Model A2000, Kin-Line #463CW or approved equivalent.

2.05 ACCESS DOORS [S]

A. Flush-mounted sheet metal access doors with lock and concealed hinge; stainless steel door; Milcore, or approved equivalent.
   1. Access doors through fire-rated separations shall have like fire rating.

2.06 EQUIPMENT IDENTIFICATION [S]

A. General: Identify all equipment using brass discs or laminated plastics. Install as specified below in readily visible locations not interfering with insulation or equipment operation.
   1. Brass Discs: Provide minimum 0.040-inch in thickness and 2-inches in diameter or square. Top line of each tag shall have 1/4-inch high black filled letters to indicate designation of service. Bottom line shall have 7/16-inch high black filled numbers to indicate equipment or valve number.
   2. Laminated Plastic: Provide white on black with engraved black letters. The equipment identifying name and number lettering size shall be a minimum of 1/4-inch in height, nameplate data 3/16-inch in height and the manufacturer's name and location 1/8-inch in height. Provide laminated plastic tags either 2-1/2-inches by 3-1/2-inches or 3-1/2-inches by 5-inches, as required.

2.07 PIPING IDENTIFICATION [S]

A. Piping identification shall be by semi-rigid plastic markers or vinyl coated cloth; minimum

information: base color, flow direction arrow, and fluid being conveyed.

1. Service Markers, Interior Locations: W.H. Brady Co. Type B-500 vinyl coated cloth tape or Type B-350 Perma-Code Thin Film, or approved equivalent.
2. Service Markers, Exterior Locations: W.H. Brady Co. Type B-946G, Brady B-915 Snap-on, or approved equivalent. Apply mechanically affixed with coated wire straps or approved equivalent.

B. Base color coding and size of letters and arrows shall conform to ANSI A 13.1, "Scheme for the Identification of Piping Systems."

2.08 PRIMERS AND PAINTS [S]

A. All equipment furnished under Division 15, unless otherwise noted, shall be furnished with a factory applied prime coat.

B. Where field priming or touch-up priming is required, primer shall be as follows for ferrous metal surfaces:
   1. Metal Surfaces, Not Galvanized: Latex, corrosion resistant primer suitable for metal surfaces or Epoxy-polyamide, green primer paint, formula 150, type I (QPL).
   2. Metal Surfaces, Galvanized: Galvanized repair compound with high zinc dust content; ZRC Cold Galvanizing Compound, or approved equivalent (no known equivalent).

C. Finish painting of Mechanical equipment furnished under Division 15: See Section 09900 - Paints and Coatings.
   1. Non-metallic surfaces: Latex (Acrylic Emulsion, Exterior Wood and Masonry) Paint.

2.09 SEALANTS [S]

A. Non-fireproof Penetrations: Silicone rubber sealant; DowCorning 785/4, or approved equivalent.

B. Fireproof Penetrations: Sealant shall comply with ASTM-E-814 (UL 1479 or UL 94); 3M Brand Fire Barrier Penetration Sealing System with CP-25 caulk, or approved equivalent.

2.10 SEALANTS, WATERSTOP

A. Cold applied, pre-formed, plasticized, waterstop sealing compound consisting of blends of refined hydrocarbon resins and plasticizing compounds; Synko-Flex Waterstop and Primer, or approved equivalent (no known equivalent).

2.11 BOLTED MECHANICAL SEALS [S]

A. Seals shall be modular, bolted, mechanical link type, consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and wall opening. Links shall be loosely assembled with bolts to form a continuous rubber belt around the pipe with a pressure plate under each bolt head and nut. Tightening of the bolts shall cause the rubber sealing elements to expand to form a water-tight seal between the pipe and the sleeve; Thunderline "Link-Seal" Model LS, or approved equivalent.

2.12 PIPE SLEEVES

A. Sleeves in Concrete Floor Slabs: Schedule 40 black steel pipe.

B. Sleeves in all Fire Walls (regardless of Construction), Concrete or Masonry Walls: Schedule 40 black steel pipe.

C. Sleeves in all Walls and Partitions (except Fire Walls, Concrete or Masonry Walls): 18-gauge galvanized steel.

2.13 NON-SHRINK GROUT

A. Non-shrink, non-metallic, non-corrosive cementious grout; 5000 psi compressive strength at 28 days; Sika SilkaGrout 212, or approved equivalent.

PART 3 EXECUTION

3.01 GENERAL

A. Install products in accordance with product manufacturer's recommendations. After installation of systems and until formal acceptance of systems by the Owner, be responsible for operation and maintenance of systems.

3.02 FORMING, CUTTING, AND PATCHING

A. Provide Forming, recesses, chases, blocking and grounds necessary for Mechanical Work.

B. Provide Cutting (including core drilling and saw cutting), patching and repairing existing structures to accommodate the Mechanical Work. Such work shall include voids, holes, and the like resulting from removal of existing or addition of new Mechanical Work. Restoration shall match existing work.

C. Core drill all holes through existing concrete structures. Before drilling through any structural members, obtain written permissions form the Architect. Before coring, check all proposed hole locations with electronic device to assure clearance of obstruction (i.e., reinforcement bars, piping, conduits, etc.).

D. Saw cut all existing concrete and masonry openings and slabs.

3.03 ELECTRICAL WORK

A. Coordinate with Division 26. See Division 26 Contract Documents for voltage and phase of electrical services.

B. All power wiring and conduits for same serving motors, and where indicated on Division 26 Contract Drawings, to mechanical control panels, separate or equipment mounted, shall be provided under Division 26.

C. The following shall be provided under Division 23:
   1. Pre-wired mechanical control panels.
   2. All automatic or temperature control and interlock wiring, regardless of voltage, and conduits for same necessary for proper operation of equipment under Division 23. This includes interlock wiring between motor starter coils, interlocking relays, contactors, mechanical equipment control panels, temperature control devices, and temperature control panels.
   3. Power wiring and conduits for same not indicated on the Division 26 Contract Drawings to mechanical control panels (separate or equipment mounted).

D. Install all wiring under Division 23 in rigid conduit or electrical metallic tubing indoors and in rigid conduit outdoors. All such wiring shall be concealed.

3.04 DIELECTRIC UNIONS

A. Install dielectric unions in acceptable locations and provide devices for all piping and equipment connections where ferrous and copper metal is joined.

B. Where piping is buried, provide additional protection in the following manner. Thoroughly clean device and piping surfaces 5-feet upstream and downstream of connection point. Prime piping surface to be covered. Wrap connection point and piping with double wrapping of identified pressure-sensitive tape.

3.05 WELDING

A. All welding shall comply with provisions of applicable ASME Boiler and Pressure Vessel Code, ANSI Code for Pressure Piping, or other statutes or ordinances having jurisdiction. All welders shall be certified for all welding positions under the qualification tests prescribed by the National Certified Welding Bureau; National Association of Plumbing, Heating, Cooling Contractors; or by other reputable testing laboratories, using procedures covered in the ASME Boiler

Construction Code, Section IX, Qualification standards for Welding and Brazing Procedures, Welders, Brazers and Welding and Brazing Operators; and shall hold a current certification of his qualifications obtained within 12 months prior to date of contract. Prior to welding operation, submit for review evidence of such certification.

B. Welded joints, fabrication, assembly and erection shall conform to the requirements of ANSI B 31.1 "Power Piping" of the American National Standard Code for Pressure Piping. Perform all welding by the metal-arc welding process, either manual, semi-automatic or automatic.

C. Welding qualifications shall conform to the requirements of Section IX "Welding and Brazing Qualifications" of the ASME Boiler and Pressure Vessel Code. Proof of qualifications, issued within the previous twelve months, is required from a testing agency approved by the Owner.

3.06 EXCAVATION AND BACKFILL

A. Excavation and backfill shall be in accordance with the requirements of the Division 2 section on the excavation and backfilling, as specified in other Division 23 sections, and as herein described. Where depths or invert elevations are not indicated, provide minimum coverage (above top of pipes) as follows:
   1. Any piping under slab (top of pipe to underside of slab): 18-inches.
   2. Steel, cast iron, and copper in other locations: 18-inches.

B. Excavate to undisturbed earth; cut level and form true. Remove debris, rubbish and soft material (such as mud). Where rock is encountered, undercut trenches 6-inches and fill with well tamped neutral sand and pea gravel to proper elevation. During installation of piping, maintain excavation free of standing water. Undercut trench 6-inches and install piping in a 6-inch neutral sand envelope.

C. Do not backfill until piping has been successfully tested.

D. Backfill to a point 12-inches above top of piping with earth (excavated material may be used) free of clay, debris, rubbish, rocks, or clods over 4-inches in the greatest dimensions. Backfill above 12-inches from top of piping may be with excavated material. Apply backfill by hand in 6-inch deep layers the full width of the trench. Moisten each layer (do not flood or puddle), and hand tamp to a minimum 90 percent compaction before proceeding with the next layer of backfill.

E. Do not excavate under foundations or footings except in manner permitted. Do not backfill until installed piping has been successfully tested.

F. Provide a 12-inch neutral sand envelope all around buried tanks.

G. Dewatering:
   1. Lay pipe in dry trenches and keep trenches completely dry until piping system has been tested, cleaned, insulated, sealed, inspected and accepted by the Owner and completely backfilled before dewatering function ceases.
   2. Furnish and operate pumps, well points, siphons or other equipment as may be required to provide complete dewatering of trenches and disposal of excess water.

3.07 PIPE SUPPORT INSTALLATION

A. Support all piping, horizontal and vertical, with clamps or brackets. Independently support all line-mounted equipment. Provide at least one hanger for each branch piping and at each change of direction. Secure all hanger rods with double nuts and lock washers. Do not use perforated (plumber's) tape. Support vertical multiple-story piping at each floor with pipe clamps.

B. Maximum Hanger Spacing:
   1. Cast Iron Soil, Waste, or vent Piping: Hangers at 5-feet and at each joint or fitting.
   2. Steel Piping: 1-inch and smaller, hangers at 8-feet; 1-1/4-inches and larger, hangers at 10-feet.

3. Copper Piping: 1-1/2-inches and smaller, hangers at 6-feet; 2-inches and larger, hangers at 10-feet.
4. In all cases, space pipe supports to provide adequate support for the pipes, the medium in the pipes, insulation, valves, and fittings to prevent any sagging or separation of joints.

3.08 PIPING INSTALLATION

A. Layout of work:
1. Perform all dimensional layout of the Work and establish all lines and grades as set forth on the Drawings.
2. Be responsible for conformity of the finished work with drawings and specifications.

B. Installation:
1. Inspect all piping prior to installation. Pipe found unsatisfactory on inspection or damaged by handling shall be promptly removed from the job site.
2. All piping systems shall be graded and valved to provide complete drainage, venting, and control of all systems.
3. Install all buried non-metallic piping with a continuous number 14 plastic-coated copper wire paralleling piping.
4. Use reducing fittings for pipe size changes; do not use brushings. Make all changes in pipe material with pipe adapters.
5. Prior to installation of piping to or at mechanical equipment, verify with the equipment manufacturers as to the clearance required for maintenance, repair, inspection, and part replacement for the respective equipment. Install piping to provide such clearance so that an absolute minimum of piping is required to be disturbed. Provide means for removal of such piping. Provide unions/flanges/mechanical couplings at connections to equipment.
6. Where equipment connection sizes are smaller than piping sizes indicated, make size reduction immediately adjacent to the equipment connections. Flanges or unions at such equipment connection points may be the same size as the equipment connections.
7. Install horizontal sanitary piping to uniform grades conforming to the applicable Code for this installation.
8. Conceal all piping in finished portions of the building unless noted otherwise on the Drawings.
9. Coupled short sections of pipe, bushings, close nipples, long screws, bullhead tees and crosses are prohibited. Bullhead tees and crosses are permitted only in fire sprinkler systems.
10. Install all piping in such a manner as to prevent any undue noise form the flow of water under normal conditions.
11. Branch tees in piping, provided that the branch size is two pipe sizes or smaller than the main size, may be made with factory-manufactured outlet fittings with funneled inlet and with socket or threaded outlet as required. The fittings schedule shall be the same as the piping to which they are connected. For copper tubing fittings shall be joined to main by silver brazing. The use of extruded tees for branch takeoffs that are fabricated from the piping material being installed is expressly prohibited and will be rejected.
12. Install piping to permit free expansion and contraction, except where the Drawings specifically indicate an anchor or guide. Do not connect stiffening structural members to bends or elbows.
13. Use offsets necessary to prevent undue strain on piping. The springing of piping into place is prohibited.
14. Select and install pipe supports and hangers in such a manner as to impose only negligible restraint on the free movement of piping and not deform piping. No anchors shall be employed, except as indicated on Drawings.
15. Locate pipe supports as close as possible to valves or other heavy piping specialties.
16. Carefully locate supports and hangers so they do not hinder free movement of adjoining piping or occupy open space in a pipe rack.
17. Mark all stub-outs below grade with monuments identifying the services.
18. Provide shut-off valves at each division of main piping and at each branch serving one

room or a group of adjoining rooms to enable isolation of fluid carrying piping systems for each portion of the building (buried piping excepted).

19. Valves shall be full size of the line in which they are installed (automatic control valves excepted). Prior to installation of control valves, verify with control manufacturer as to sizes, piping hookup, and the like for same.
20. Install valves with stems straight up wherever possible; do not install valves with stems below the horizontal position.
21. Provide spool between two adjacent valves.
22. Properly grade all water piping to provide flow, air elimination, and drainage. Do not install piping so as to create noise or flow impairment.
23. Separately pipe, with shut-off valve, equipment drains to nearest floor drain, or as noted on Contract Drawings.
24. Do not permit the use of any mechanical piping system under this Division of Work to be used as electrical grounding.
25. Buried Piping:
    a. Carefully handle and lower pipe in such a manner as to avoid damage to the pipe.
    b. Excavate a socket hole under the joint so that pipe will be supported on its body. Provide socket holes large enough (but not excessive) to allow adequate space for workmen to "make" the joints.
26. Thrust Blocks:
    a. Provide concrete thrust blocks at all changes in direction of buried piping of non-restrained mechanical joined pressure systems and other systems as required.
    b. Provide thrust blocks for buried restrained mechanical jointed piping systems where indicated.
    c. Provide thrust blocks of 3000 psi concrete mix conforming to the requirements of the Division 3 section on concrete.
    d. Provide thrust blocks of the required size and shape necessary for the specific system pressure and soil bearing capacity at the particular locations.
    e. Exercise care to avoid encasing fittings, bends, valves, etc., in concrete to the extent that it will hamper maintenance.

3.09 PIPE JOINTS

A. Threaded Steel or Brass Pipe:
   1. Cut square and remove all burrs. Ream for full flow.
   2. Cut threads with clean dies. Apply thread compound to male threads only. Refer to specific piping system for type of thread compound.
   3. After joining, not more than three full threads shall remain exposed. Coat exposed threads of steel pipe with appropriate type red paint.
   4. Make-up brass, chrome plated pipe, or stainless steel pipe with strap wrenches.

B. Copper Tubing:
   1. Cut square and remove all burrs. Ream for full flow.
   2. Clean outside ends of tubing and male fittings and sockets of female fittings to bright finish. Clean with emery cloth.
   3. Properly apply flux to surfaces being jointed. Application and type of flux shall be as recommended by the specific brazing or solder manufacturer.
   4. Remove stems, washers and internal parts of valves prior to brazing or soldering.
   5. Refer to specific piping system for type of brazing metal and solder.

C. Ductile Iron Pipe and Fitting Mechanical Joints: Install mechanical joints in accordance with AWWA C 600.

D. Grooved Pipe and Fitting Mechanical Joints: Install joints including grooving of pipe, in accordance with the coupling and fittings manufacturer's recommendations and printed instructions. Before couplings are assembled, pipe ends and gasket exterior surfaces shall be lightly coated with a lubricant manufactured especially for this application and recommended by the coupling and fitting manufacturer.

E. Flanged Joints: Use flanged joints for making piping connections to flanged valves, fixtures, and equipment, and to other flanged piping components. Install joints so that flange faces bear uniformly on gaskets. Engage bolts so that there is complete threading through the nuts and tighten so that bolts are uniformly stressed (equally torqued).

F. Cast Iron Soil Pipe:
   1. Hubless Joints:Install clamp assemblies with bolts alternately and incrementally tightened to manufacturer's recommended torque. Use a single set-point torque wrench manufactured specifically for this purpose. The use of screwdrivers or other types of wrenches will not be permitted. After a period of at least 24 hours, re-torque each bolt.

G. Solvent-Weld Joints in Plastic Piping: Install solvent welded joints for CPVC, PVC or ABS plastic piping in accordance with the recommendations and printed instructions of each respective pipe and fitting manufacturers and with requirements of pertinent ASTM standards.

3.10 PIPE SLEEVES AND PLATES

A. Sleeves:
   1. Provide sleeves for all pipes passing through walls, partitions of floor slabs unless specified otherwise.
   2. Sleeves in concrete floor slabs: Sleeves shall project 2-inches above finished floors, unless specified otherwise.
   3. Sleeves in all Fire Walls (regardless of construction), Concrete or Masonry Walls: Finished flush with wall finish, unless specified otherwise.
   4. Sleeves in all Walls and Partitions (except Fire Walls, Concrete or Masonry Walls): Finished flush with wall or partition finish.
   5. Provide 1/2-inch clearance completely around pipe between sleeve and non-insulated piping, except where pipes pass through exterior walls below grade, provide full 1-inch clearance between pipe and sleeve.
   6. Sleeves for insulated piping shall be sized for insulation, pipe and clearance specified for non-insulated pipes.
   7. Caulk sleeves set in fire rated construction with sealant specified for fireproof penetrations and caulk sleeves set in non-fireproof construction with sealant specified for non-fireproof penetrations.
   8. Seal sleeves watertight when they are installed in outside walls, walls below grade and in floor slabs with waterproof epoxy grout, except as specified otherwise.

B. Plates: Provide chrome-plated hinged escutcheon plates with locking devices where pipes pierce finished surfaces. Plates shall fit outside of pipe insulation.

3.11 MAINTENANCE AND ACCESS TO EQUIPMENT

A. Where valves, dampers, control devices, coils, or other like devices (i.e, plumbing P-trap, water hammer arresters, gauges, thermometers) requiring maintenance, checking or readings are inaccessibly concealed in walls or ceilings, and where indicated, provide square or rectangular access doors. Where space permits, doors for ceiling installation shall not be less than 18-inches by 18-inches. Prior to installation, verify all access locations.

B. Where there are lubrications within equipment, extend such to exterior of equipment.

3.12 REVIEW OF WORK

A. Do not allow or cause any mechanical work to be covered, concealed or enclosed until such work has been tested and reviewed. Should such work be covered, concealed or enclosed before being tested and reviewed, such shall be uncovered and thereafter restored at no additional cost.

3.13 EQUIPMENT IDENTIFICATION

A. Manufacturer's Nameplates: Provide all equipment with manufacturer's nameplates secured to the respective equipment and indicating, but not being limited to, the manufacturer's name,

model, size, serial number, capacity and electrical characteristics. Clean, polish and protect all such nameplates with a coat of clear protective finish.

B. Equipment Tags: Identify all equipment (such as machinery, motor starters, control panels, pushbuttons and other like devices) exposed to view with identification tags. Secure tags to equipment surface. Where size or surface curvature does not permit such, secure with No. 16 brass jack chain.

C. Valve Tags:
   1. Identify each valve with a tag with distinguishing number. Secure tags to valves with No. 16 brass jack chain.
   2. Provide valve chart and schedule in aluminum frame with clear heavy plastic shield, and mount same at location directed. Indicate on the Record Drawings the location of valves with numbers corresponding to the valve schedule. Valve chart and schedule shall include, but not be limited to, tag number, location, usage/function, valve manufacturer's name and valve model number. Numbers for new valves shall continue from existing valve numbering system.

D. Piping Identification:
   1. Identify each pipe, whether concealed or exposed, as to the content and character of material it carries (piping buried excepted).
   2. Location of Markers: Not to exceed 20-feet on straight run of pipe (including risers and drops) and so located as to be conspicuously visible from any reasonable vantage point; adjacent each valve; adjacent each tee; at each side of penetration of the structure or enclosure; at each obstruction.

3.14 PRIMING, PAINTING, AND COATING

A. Properly clean surfaces to be touched up of rust, dirt, scale, wax and other deleterious materials. Prime surfaces. Touch up with like material all damaged galvanized or factory-primed metal surfaces. Do not prime over manufacturer's nameplates on equipment.

B. Coat all bare steel parts of piping accessories below grade with coats of coal-tar based bituminous mastic.

C. Except for factory priming, factory finish painting and otherwise specified under this Article, all field priming (except touch up) and finish painting shall be under other Divisions.

D. Paint flat black interior surfaces of all concealed unlined galvanized sheet metal ductwork behind air outlets and inlets.

E. All exposed insulation surfaces in finished areas shall be ready for finish painting; glue size if necessary.

3.15 CLEANING AND DE-GREASING OF PIPING

A. General:
   1. Clean all piping systems to remove all dirt, grease, scale, foreign substances, etc., as specified in each separate section of the Specifications.
   2. Prior to commencing work, submit for approval a complete procedure for cleaning and flushing for each separate piping system. Include flushing source, system inlet flushing pressure and size of inlet and outlet flushing connections with their locations for each system. Install flushing connections at all low points of each piping system to ensure complete flushing of the system.
   3. Use air and/or gas blown through the lines of gas and air systems, unless specified otherwise, to prove the piping clean. All other piping systems shall be thoroughly flushed out with water unless specified otherwise.

3.16 TESTING OF PIPING

A. Provide notification of test at least three working days prior to tests on all part of any piping

system. Do not allow or cause any piping system to be insulated, covered, concealed or enclosed until such systems have been tested and reviewed.

B. Provide all necessary materials (including temporary isolation valves or caps), pumps, testing media and labor for testing. Temporarily remove any device in piping system which will not withstand test pressure specified, and reinstall same after successful testing. Test time begins to accrue full test pressure is achieved.

C. Testing and inspection of all piping systems and associated equipment for leaks shall be accomplished after installation and cleaning and prior to placing into service. Flanges, threaded joints and all welds shall be left unpainted and un-insulated until the piping systems have been approved.

D. A rigid visual inspection of each specific piping system shall be made prior to conducting tightness tests, to ascertain that all appurtenances and equipment are provided, properly connected and supported, and in all respects ready for testing.

E. Equipment such as safety valves and similar equipment shall not be subjected to the piping system test pressure. Equipment shall either be disconnected from the piping or be isolated by valves or blanks during testing and reinstalled after acceptance by the Owner.

F. Indicating pressure gauges mounted locally may be tested with the lines provided the test pressure does not exceed the scale range.

G. Orifice plates, rotometers, displacement meters and other line inserts shall either not be installed until completion of all testing, or shall be removed prior to any tests and reinstalled after test has been accepted by the Owner.

H. The application of pressure to a system shall be under control at all times, so that in no case shall the test pressure be exceeded by more than 6 percent.

I. Gauges used for testing shall be tested for accuracy as directed or approved by the Owner, and then installed as close as possible to the low point of the piping system.

J. Do not apply test pressure until the piping system and its contents approach the same temperature.

K. While piping is under test, exercise care so that excessive pressure does not occur due to increase in ambient temperature.

L. Piping test pressure shall be as noted in tabulation. If test pressures are not specified, they shall be 150 percent of design pressure for the specific system being tested.

SYSTEM	TEST MEDIUM	TEST PRESSURE (PSIG)	DURATION (HOURS)	ACCEPTANCE TOLERANCE
Sewer & Vent	Water	Top of highest vent	4	No joint sweat
Water	Water	150	4	None except temp. change
Pumped Storm Water	Water	150	4	None except temp. change
Fire Sprinkler	Water	200	4	None except temp. change

M. Conduct hydrostatic tests with water at a temperature below 100 degrees F.
1. Fill the system slowly with water and vent at highest points to expel the air before

pressurizing.
2. Carefully examine all joints for leaks or defects.
3. Provide connections as required to accomplish the above.

N. Keep accurate test records of each line or system tested and provide copies of same to Owner after acceptance. Each test shall include:
1. Identification of piping system and test number.
2. Testing medium.
3. Test pressure.
4. Date of test acceptance.

3.17 TESTS AND ADJUSTMENTS

A. At the completion of the Work, completely adjust all valves and equipment for their proper use and rating.

END OF SECTION

SECTION 23 05 93

TESTING, ADJUSTING, AND BALANCING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Testing, adjustment, and balancing of air systems.

B. Measurement of final operating condition of HVAC systems.

1.02 ALLOWANCES

A. Allowance includes testing, adjusting, and balancing of mechanical systems.

1.03 REFERENCES

A. AABC MN-1 - AABC National Standards for Total System Balance; Associated Air Balance Council; 2002.

B. ASHRAE Std 111 - Practices for Measurement, Testing, Adjusting and Balancing of Building Heating, Ventilation, Air-Conditioning, and Refrigeration Systems; American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.; 1988.

C. NEBB (TAB) - Procedural Standards for Testing Adjusting Balancing of Environmental Systems; National Environmental Balancing Bureau; 2005, Seventh Edition.

D. SMACNA (TAB) - HVAC Systems Testing, Adjusting, and Balancing; Sheet Metal and Air Conditioning Contractors' National Association; 2002.

1.04 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Qualifications: Submit name of adjusting and balancing agency and TAB supervisor for approval within 30 days after award of Contract.

C. TAB Plan: Submit a written plan indicating the testing, adjusting, and balancing standard to be followed and the specific approach for each system and component.
   1. Submit to the Construction Manager.
   2. Submit six weeks prior to starting the testing, adjusting, and balancing work.
   3. Include certification that the plan developer has reviewed the contract documents, the equipment and systems, and the control system with the Architect and other installers to sufficiently understand the design intent for each system.
   4. Include at least the following in the plan:
      a. Preface: An explanation of the intended use of the control system.
      b. List of all air flow, water flow, sound level, system capacity and efficiency measurements to be performed and a description of specific test procedures, parameters, formulas to be used.
      c. Copy of field checkout sheets and logs to be used, listing each piece of equipment to be tested, adjusted and balanced with the data cells to be gathered for each.
      d. Identification and types of measurement instruments to be used and their most recent calibration date.

e. Discussion of what notations and markings will be made on the duct and piping drawings during the process.
f. Final test report forms to be used.
g. Detailed step-by-step procedures for TAB work for each system and issue, including:
   1) Terminal flow calibration (for each terminal type).
   2) Diffuser proportioning.
   3) Branch/submain proportioning.
   4) Total flow calculations.
   5) Rechecking.
   6) Diversity issues.
h. Expected problems and solutions, etc.
i. Criteria for using air flow straighteners or relocating flow stations and sensors.
j. Details of how TOTAL flow will be determined; for example:
   1) Air: Sum of terminal flows via control system calibrated readings or via hood readings of all terminals, supply (SA) and return air (RA) pitot traverse, SA or RA flow stations.
k. Specific procedures that will ensure that air side is operating at the lowest possible pressures and methods to verify this.
l. Confirmation of understanding of the outside air ventilation criteria under all conditions.
m. Method of verifying and setting minimum outside air flow rate will be verified and set and for what level (total building, zone, etc.).
n. Method of checking building static and exhaust fan and/or relief damper capacity.
o. Proposed selection points for sound measurements and sound measurement methods.
p. Methods for making coil or other system plant capacity measurements, if specified.
q. Time schedule for TAB work to be done in phases (by floor, etc.).
r. Description of TAB work for areas to be built out later, if any.
s. Time schedule for deferred or seasonal TAB work, if specified.
t. False loading of systems to complete TAB work, if specified.
u. Exhaust fan balancing and capacity verifications, including any required room pressure differentials.
v. Procedures for field technician logs of discrepancies, deficient or uncompleted work by others, contract interpretation requests and lists of completed tests (scope and frequency).
w. Procedures for formal progress reports, including scope and frequency.
x. Procedures for formal deficiency reports, including scope, frequency and distribution.

D. Progress Reports.

E. Final Report: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
1. Submit under provisions of Section 01400.
2. Submit to the Construction Manager and HVAC controls contractor within two weeks after completion of testing, adjusting, and balancing.
3. Revise TAB plan to reflect actual procedures and submit as part of final report.
4. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Architect and for inclusion in operating and maintenance manuals.
5. Provide reports in 3 ring binder manuals, complete with index page and indexing tabs, with cover identification at front and side. Include set of reduced drawings with air outlets and equipment identified to correspond with data sheets, and indicating thermostat locations.
6. Include actual instrument list, with manufacturer name, serial number, and date of calibration.

7. Form of Test Reports: Where the TAB standard being followed recommends a report format use that; otherwise, follow ASHRAE Std 111.
8. Units of Measure: Report data in I-P (inch-pound) units only.
9. Include the following on the title page of each report:
   a. Name of Testing, Adjusting, and Balancing Agency.
   b. Address of Testing, Adjusting, and Balancing Agency.
   c. Telephone number of Testing, Adjusting, and Balancing Agency.
   d. Project name.
   e. Project location.
   f. Project Owner.
   g. Project Engineer.
   h. Project Contractor.
   i. Project altitude.
   j. Report date.

F. Project Record Documents: Record actual locations of flow measuring stations and balancing valves and rough setting.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. Perform total system balance in accordance with one of the following:
   1. AABC MN-1, AABC National Standards for Total System Balance.
   2. NEBB Procedural Standards for Testing Adjusting Balancing of Environmental Systems.
   3. Maintain at least one copy of the standard to be used at project site at all times.

B. Begin work after completion of systems to be tested, adjusted, or balanced and complete work prior to Substantial Completion of the project.

C. Where HVAC systems and/or components interface with life safety systems, including fire and smoke detection, alarm, and control, coordinate scheduling and testing and inspection procedures with the authorities having jurisdiction.

D. TAB Agency Qualifications:
   1. Company specializing in the testing, adjusting, and balancing of systems specified in this section.
   2. Having minimum of three years documented experience.
   3. Certified by one of the following:
      a. AABC, Associated Air Balance Council: www.aabchq.com; upon completion submit AABC National Performance Guaranty.
      b. NEBB, National Environmental Balancing Bureau: www.nebb.org.

E. TAB Supervisor Qualifications: Certified by same organization as TAB agency.

F. TAB Supervisor Qualifications: Professional Engineer licensed in the State in which the Project is located.

3.02 EXAMINATION

A. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
   1. Systems are started and operating in a safe and normal condition.
   2. Temperature control systems are installed complete and operable.
   3. Proper thermal overload protection is in place for electrical equipment.
   4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
   5. Duct systems are clean of debris.
   6. Fans are rotating correctly.

7. Fire and volume dampers are in place and open.
8. Air coil fins are cleaned and combed.
9. Access doors are closed and duct end caps are in place.
10. Air outlets are installed and connected.
11. Duct system leakage is minimized.
12. Service and balance valves are open.

B. Submit field reports. Report defects and deficiencies noted during performance of services which prevent system balance.

C. Beginning of work means acceptance of existing conditions.

3.03 PREPARATION

A. Hold a pre-balancing meeting at least one week prior to starting TAB work.
1. Require attendance by all installers whose work will be tested, adjusted, or balanced.

B. Provide instruments required for testing, adjusting, and balancing operations. Make instruments available to Owner to facilitate spot checks during testing.

C. Provide additional balancing devices as required.

3.04 INSTALLATION TOLERANCES

A. Air Handling Systems: Adjust to within plus or minus 10 percent of design for supply systems and plus or minus 10 percent of design for return and exhaust systems.

B. Air Outlets and Inlets: Adjust total to within plus or minus 10 percent of design to space. Adjust outlets and inlets in space to within plus or minus 10 percent of design.

3.05 RECORDING AND ADJUSTING

A. Field Logs: Maintain written logs including:
1. Running log of events and issues.
2. Discrepancies, deficient or uncompleted work by others.
3. Contract interpretation requests.
4. Lists of completed tests.

B. Ensure recorded data represents actual measured or observed conditions.

C. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.

D. Mark on the drawings the locations where traverse and other critical measurements were taken and cross reference the location in the final report.

E. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.

F. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.

G. At final inspection, recheck random selections of data recorded in report. Recheck points or areas as selected and witnessed by the Owner.

H. Check and adjust systems approximately six months after final acceptance and submit report.

3.06 AIR SYSTEM PROCEDURE

A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities at site altitude.

B. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.

C. Measure air quantities at air inlets and outlets.

D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.

E. Use volume control devices to regulate air quantities only to extend that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.

F. Vary total system air quantities by adjustment of fan speeds. Provide drive changes required. Vary branch air quantities by damper regulation.

G. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.

H. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for 50 percent loading of filters.

I. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.

J. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.

K. Where modulating dampers are provided, take measurements and balance at extreme conditions. Balance variable volume systems at maximum air flow rate, full cooling, and at minimum air flow rate, full heating.

L. Measure building static pressure and adjust supply, return, and exhaust air systems to provide required relationship between each to maintain approximately 0.05 inches (12.5 Pa) positive static pressure near the building entries.

3.07 SCOPE

A. Test, adjust, and balance the following:
   1. Forced Air Units
   2. Fans
   3. Air Filters
   4. Air Inlets and Outlets

3.08 MINIMUM DATA TO BE REPORTED

A. Electric Motors:
   1. Manufacturer
   2. Model/Frame
   3. HP/BHP
   4. Phase, voltage, amperage; nameplate, actual, no load
   5. RPM
   6. Service factor
   7. Starter size, rating, heater elements
   8. Sheave Make/Size/Bore

B. Air Moving Equipment:
   1. Location
   2. Manufacturer
   3. Model number
   4. Serial number
   5. Arrangement/Class/Discharge
   6. Air flow, specified and actual
   7. Return air flow, specified and actual
   8. Outside air flow, specified and actual
   9. Total static pressure (total external), specified and actual

10. Inlet pressure
11. Discharge pressure
12. Sheave Make/Size/Bore
13. Number of Belts/Make/Size
14. Fan RPM

C. Return Air/Outside Air:
1. Identification/location
2. Design air flow
3. Actual air flow
4. Design return air flow
5. Actual return air flow
6. Design outside air flow
7. Actual outside air flow
8. Return air temperature
9. Outside air temperature
10. Required mixed air temperature
11. Actual mixed air temperature
12. Design outside/return air ratio
13. Actual outside/return air ratio

D. Air Distribution Tests:
1. Air terminal number
2. Room number/location
3. Terminal type
4. Terminal size
5. Area factor
6. Design velocity
7. Design air flow
8. Test (final) velocity
9. Test (final) air flow
10. Percent of design air flow

END OF SECTION

SECTION 23 07 13

DUCT INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Duct insulation.

1.02 RELATED SECTIONS

A. Section 09900 - Paints and Coatings: Painting insulation jackets.

1.03 REFERENCES

A. ASTM C 518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2004.

B. ASTM C 553 - Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2002.

C. ASTM C 612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2004.

D. ASTM C 1071 - Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material); 2005.

E. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2005.

F. ASTM E 96/E 96M - Standard Test Methods for Water Vapor Transmission of Materials; 2005.

G. ASTM G 21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 1996 (Reapproved 2002).

H. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials; National Fire Protection Association; 2006.

I. SMACNA (DCS) - HVAC Duct Construction Standards - Metal and Flexible; Sheet Metal and Air Conditioning Contractors' National Association; 2005.

J. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Underwriters Laboratories Inc.; 2003.

1.04 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

C. Manufacturer's Instructions: Indicate installation procedures which ensure acceptable workmanship and installation standards will be achieved.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND PROTECTION

A. Accept materials on site in original factory packaging, labelled with manufacturer's identification, including product density and thickness.

B. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical

damage, by storing in original wrapping.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.

B. Maintain temperature during and after installation for minimum period of 24 hours.

PART 2 PRODUCTS

2.01 REQUIREMENTS FOR ALL PRODUCTS OF THIS SECTION

A. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E 84.

2.02 GLASS FIBER, FLEXIBLE

A. Manufacturer:
1. Knauf Fiber Glass: www.knaufusa.com.
2. Johns Manville Corporation: www.jm.com.
3. Owens Corning Corp: www.owenscorning.com.
4. CertainTeed Corporation: www.certainteed.com.

B. Insulation: ASTM C 553; flexible, noncombustible blanket.
1. 'K' ('Ksi') value: 0.13 at 75 degrees F, when tested in accordance with ASTM C 518.
2. Maximum Service Temperature: 450 degrees F (232 degrees C).
3. Maximum Water Vapor Sorption: 5.0 percent by weight.
4. Thickness as required to meet minimum R-8.0 insulation value.

C. Vapor Barrier Jacket:
1. Kraft paper with glass fiber yarn and bonded to aluminized film.
2. Moisture Vapor Permeability: 0.02 perm inch (0.029 ng/Pa s m), when tested in accordance with ASTM E 96/E 96M.
3. Secure with pressure sensitive tape.

D. Vapor Barrier Tape:
1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.

E. Outdoor Vapor Barrier Mastic:
1. Vinyl emulsion type acrylic or mastic, compatible with insulation, black color.

F. Tie Wire: Annealed steel, 16 gage (1.5 mm).

2.03 GLASS FIBER, RIGID

A. Manufacturer:
1. Knauf Fiber Glass: www.knaufusa.com.
2. Johns Manville Corporation: www.jm.com.
3. Owens Corning Corp: www.owenscorning.com.
4. CertainTeed Corporation: www.certainteed.com.

B. Insulation: ASTM C 612; rigid, noncombustible blanket.
1. 'K' ('Ksi') value: 0.13 at 75 degrees F, when tested in accordance with ASTM C 518.
2. Maximum service temperature: 450 degrees F (232 degrees C).
3. Maximum Water Vapor Sorption: 5.0 percent.
4. Maximum Density: 8.0 lb/cu ft (128 kg/cu m).
5. Thickness as required to meet minimum R-8.0 insulation value.

C. Vapor Barrier Jacket:
1. Kraft paper with glass fiber yarn and bonded to aluminized film.
2. Moisture Vapor Permeability: 0.02 perm inch (0.029 ng/Pa s m), when tested in

accordance with ASTM E 96/E 96M.
3. Secure with pressure sensitive tape.

D. Vapor Barrier Tape:
1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.

E. Indoor Vapor Barrier Finish:
1. Cloth: Untreated; 9 oz/sq yd (305 g/sq m) weight, glass fabric.
2. Vinyl emulsion type acrylic, compatible with insulation, black color.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that ducts have been tested before applying insulation materials.

B. Verify that surfaces are clean, foreign material removed, and dry.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in accordance with NAIMA National Insulation Standards.

C. Insulated ducts conveying air below ambient temperature:
1. Provide insulation with vapor barrier jackets.
2. Finish with tape and vapor barrier jacket.
3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
4. Insulate entire system including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints.

D. Exterior Applications: Provide insulation with vapor barrier jacket. Cover with outdoor jacket.

E. External Duct Insulation Application:
1. Secure insulation with vapor barrier with wires and seal jacket joints with vapor barrier adhesive or tape to match jacket.
2. Secure insulation without vapor barrier with staples, tape, or wires.
3. Install without sag on underside of duct. Use adhesive or mechanical fasteners where necessary to prevent sagging. Lift duct off trapeze hangers and insert spacers.
4. Seal vapor barrier penetrations by mechanical fasteners with vapor barrier adhesive.
5. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.

F. Duct and Plenum Liner Application:
1. Adhere insulation with adhesive for 100 percent coverage.
2. Secure insulation with mechanical liner fasteners. Refer to SMACNA HVAC Duct Construction Standards - Metal and Flexible for spacing.
3. Seal and smooth joints. Seal and coat transverse joints.
4. Seal liner surface penetrations with adhesive.
5. Duct dimensions indicated are net inside dimensions required for air flow. Increase duct size to allow for insulation thickness.

END OF SECTION

SECTION 23 31 13

DUCTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal ductwork.

B. Flexible ductwork.

B. Casing and plenums.

1.02 RELATED SECTIONS

A. Section 09900 - Paints and Coatings: Weld priming, weather resistant, paint or coating.

B. Section 230713 - Duct Insulation: External insulation and duct liner.

C. Section 233300 - Air Duct Accessories.

D. Section 233713 - Diffusers, Registers, and Grilles.

E. Section 230593 - Testing, Adjusting, and Balancing.

1.03 REFERENCES

A. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2005a.

B. NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems; National Fire Protection Association; 2002.

C. NFPA 90B - Standard for the Installation of Warm Air Heating and Air Conditioning Systems; National Fire Protection Association; 2006.

D. NFPA 96 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations; National Fire Protection Association; 2004.

E. SMACNA (LEAK) - HVAC Air Duct Leakage Test Manual; Sheet Metal and Air Conditioning Contractors' National Association; 1985, First Edition.

F. SMACNA (DCS) - HVAC Duct Construction Standards - Metal and Flexible; Sheet Metal and Air Conditioning Contractors' National Association; 2005.

G. UL 181 - Standard for Factory-Made Air Ducts and Air Connectors; Underwriters Laboratories Inc.; 2005.

1.04 PERFORMANCE REQUIREMENTS

A. No variation of duct configuration or sizes 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.

1.05 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for duct materials, duct liner, and duct connections.

C. Shop Drawings: Indicate duct fittings, particulars such as gages, sizes, welds, and configuration prior to start of work for all systems.

D. Test Reports: Indicate pressure tests performed. Include date, section tested, test pressure, and leakage rate, following SMACNA (LEAK) - HVAC Air Duct Leakage Test Manual.

E. Project Record Documents: Record actual locations of ducts and duct fittings. Record changes in fitting location and type. Show additional fittings used.

1.06 REGULATORY REQUIREMENTS

A. Construct ductwork to NFPA 90A, NFPA 90B, and NFPA 96 standards.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Do not install duct sealants when temperatures are less than those recommended by sealant manufacturers.

B. Maintain temperatures within acceptable range during and after installation of duct sealants.

PART 2 PRODUCTS

2.01 MATERIALS

A. Galvanized Steel Ducts: Hot-dipped galvanized steel sheet, ASTM A 653/A 653M FS Type B, with G90/Z275 coating.

B. Steel Ducts: ASTM A 1008/A 1008M, Designation CS, cold-rolled commercial steel.

C. Insulated Flexible Ducts:
   1. Black polymer film supported by helically wound spring steel wire; fiberglass insulation; aluminized vapor barrier film.
      a. Pressure Rating: 4 inches WG (1000 Pa) positive and 0.5 inches WG (175 Pa) negative.
      b. Maximum Velocity: 4000 fpm (20.3 m/sec).
      c. Temperature Range: -20 degrees F to 175 degrees F (-28 degrees C to 79 degrees C).

D. Joint Sealers and Sealants: Non-hardening, water resistant, mildew and mold resistant.
   1. Type: Heavy mastic or liquid used alone or with tape, suitable for joint configuration and compatible with substrates, and recommended by manufacturer for pressure class of ducts.
   2. VOC Content: Not more than 250 g/L, excluding water.
   3. Surface Burning Characteristics: Flame spread of zero, smoke developed of zero, when tested in accordance with ASTM E 84.
   4. For Use With Flexible Ducts: UL labeled.

E. Hanger Rod: ASTM A 36/A 36M; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.

2.02 DUCTWORK FABRICATION

A. Fabricate and support in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.

B. Construct T's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows must be used, provide air foil turning vanes. Where acoustical lining is indicated, provide turning vanes of perforated metal with glass fiber insulation.

C. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.

D. Fabricate continuously welded round and oval duct fittings two gages heavier than duct gages indicated in SMACNA Standard. Joints shall be minimum 4 inch (100 mm) cemented slip joint, brazed or electric welded. Prime coat welded joints.

E. Provide standard 45 degree lateral wye takeoffs unless otherwise indicated where 90 degree conical tee connections may be used.

F. Where ducts are connected to exterior wall louvers and duct outlet is smaller than louver frame,

provide blank-out panels sealing louver area around duct. Use same material as duct, painted black on exterior side; seal to louver frame and duct.

2.03 DUCT MANUFACTURERS

A. Metal-Fab, Inc: www.mtlfab.com.

B. SEMCO Incorporated: www.semcoinc.com.

C. United McGill Corporation: www.unitedmcgill.com.

2.04 MANUFACTURED METAL DUCTWORK AND FITTINGS

A. Manufacture in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated. Provide duct material, gages,reinforcing, and sealing for operating pressures indicated.

B. Flat Oval Ducts: Machine made from round spiral lockseam duct with light reinforcing corrugations; fittings manufactured of at least two gages heavier metal than duct.

2.05 FLEXIBLE DUCTS

A. UL 181 defines two categories of flexible ducts. Ducts listed according to UL 181 must pass all UL 181 tests. Air connectors listed according to UL 181 must pass most, but not all, UL 181 tests and are limited to lengths of 14 feet (4.3 m) or less.

B. See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers. Retain first paragraph and list of manufacturers below. See Division 01 Section "Product Requirements."

C. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Flexmaster U.S.A., Inc.
2. McGill AirFlow LLC.
3. Ward Industries, Inc.; a division of Hart & Cooley, Inc.

D. Insulated, Flexible Duct: UL 181, Class 1, black polymer film supported by helically wound, spring-steel wire; fibrous-glass insulation; [polyethylene] [aluminized] vapor-barrier film.

E. Pressure Rating: 4-inch wg (1000 Pa) positive and 0.5-inch wg (125 Pa) negative.

F. Maximum Air Velocity: 4000 fpm (20 m/s).

G. Temperature Range: Minus 20 to plus 175 deg F (Minus 29 to plus 79 deg C).

H. Insulation R-Value: 8.0.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Duct sizes indicated are inside clear dimensions. For lined ducts, maintain sizes inside lining.

C. Install and seal metal and flexible ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.

D. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide pilot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.

E. Locate ducts with sufficient space around equipment to allow normal operating and maintenance

activities.

F. Use crimp joints with or without bead for joining round duct sizes 8 inch (200 mm) and smaller with crimp in direction of air flow.

G. Use double nuts and lock washers on threaded rod supports.

H. Connect diffusers to low pressure ducts directly or with 7 feet maximum length of flexible duct held in place with strap or clamp.

I. Connect flexible ducts to metal ducts with draw bands.

J. Set plenum doors 6 to 12 inches (150 to 300 mm) above floor. Arrange door swings so that fan static pressure holds door in closed position.

K. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.

L. At exterior wall louvers, seal duct to louver frame.

3.02 SCHEDULES

A. Ductwork Material:
   1. Supply: Galvanized Steel.
   2. Return and Relief: Galvanized Steel.
   3. General Exhaust & Outside Air: Galvanized Steel.

B. Ductwork Pressure Class:
   1. Supply: 1 inch (250 Pa)
   2. General Exhaust & Outside Air: 1 inch (250 Pa).
   3. Vehicle Exhaust: 8 inch.

END OF SECTION

SECTION 23 33 00

AIR DUCT ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Air turning devices/extractors.

B. Backdraft dampers.

C. Duct access doors.

D. Duct test holes.

E. Flexible duct connections.

F. Volume control dampers.

1.02 RELATED SECTIONS

A. Section 230548 – Vibration and Seismic Controls for HVAC Piping and Equipment.

B. Section 233113 - Ducts.

1.03 REFERENCES

A. NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems; National Fire Protection Association; 2002.

B. NFPA 92A - Standard on Smoke-Control Systems; National Fire Protection Association; 2006.

C. SMACNA (DCS) - HVAC Duct Construction Standards - Metal and Flexible; Sheet Metal and Air Conditioning Contractors' National Association; 2005.

1.04 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide for shop fabricated assemblies including volume control dampers, duct access doors, duct test holes, and hardware used. Include electrical characteristics and connection requirements.

C. Shop Drawings: Indicate for shop fabricated assemblies including volume control dampers, duct access doors, and duct test holes.

1.05 PROJECT RECORD DOCUMENTS

A. Record actual locations of access doors and test holes.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect dampers from damage to operating linkages and blades.

1.08 EXTRA MATERIALS

A. See Section 01600 - Product Requirements, for additional provisions.

PART 2 PRODUCTS

2.01 DUCT TEST HOLES

A. Temporary Test Holes: Cut or drill in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.

B. Permanent Test Holes: Factory fabricated, air tight flanged fittings with screw cap. Provide extended neck fittings to clear insulation.

2.02 FLEXIBLE DUCT CONNECTIONS

A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated.

B. Flexible Duct Connections: Fabric crimped into metal edging strip.
   1. Fabric: UL listed fire-retardant neoprene coated woven glass fiber fabric to NFPA 90A, minimum density 30 oz per sq yd (1.0 kg/sq m).
      a. Net Fabric Width: Approximately 2 inches (50 mm) wide.
   2. Metal: 3 inches (75 mm) wide, 24 gage (0.6 mm) thick galvanized steel.

C. Leaded Vinyl Sheet: Minimum 0.55 inch (14 mm) thick, 0.87 lbs per sq ft (4.2 kg/sq m), 10 dB attenuation in 10 to 10,000 Hz range.

2.03 VOLUME CONTROL DAMPERS

A. Manufacturers:
   1. Louvers & Dampers, Inc: www.louvers-dampers.com.
   2. Nailor Industries Inc: www.nailor.com.
   3. Ruskin Company: www.ruskin.com.
   4. Greenheck.

B. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated.

C. Single Blade Dampers: Fabricate for duct sizes up to 6 x 30 inch (150 x 760 mm).

D. Multi-Blade Damper: Fabricate of opposed blade pattern with maximum blade sizes 8 x 72 inch (200 x 1825 mm). Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.

E. End Bearings: Except in round ducts 12 inches (300 mm) and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon or sintered bronze bearings.

F. Quadrants:
   1. Provide locking, indicating quadrant regulators on single and multi-blade dampers.
   2. On insulated ducts mount quadrant regulators on stand-off mounting brackets, bases, or adapters.
   3. Where rod lengths exceed 30 inches (750 mm) provide regulator at both ends.

PART 3 EXECUTION

3.01 PREPARATION

A. Verify that electric power is available and of the correct characteristics.

3.02 INSTALLATION

A. Install accessories in accordance with manufacturer's instructions, NFPA 90A, and follow SMACNA HVAC Duct Construction Standards - Metal and Flexible. Refer to Section 15810 for duct construction and pressure class.

B. Provide duct test holes where indicated and required for testing and balancing purposes.

C. Provide balancing dampers at points on supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing. Install minimum 2 duct widths from duct take-off.

D. Provide balancing dampers on duct take-off to diffusers, grilles, and registers, regardless of whether dampers are specified as part of the diffuser, grille, or register assembly.

END OF SECTION

SECTION 23 37 13

DIFFUSERS, REGISTERS, AND GRILLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Diffusers.

B. Registers/grilles.

1.02 RELATED SECTIONS

A. Section 09900 - Paints and Coatings: Painting of ducts visible behind outlets and inlets.

1.03 REFERENCES

A. AMCA 500-L - Laboratory Methods of Testing Louvers for Rating; Air Movement and Control Association International, Inc.; 1999.

B. ARI 890 - Standard for Air Diffusers and Air Diffuser Assemblies; Air-Conditioning and Refrigeration Institute; 2001.

C. ASHRAE Std 70 - Method of Testing for Rating the Performance of Air Outlets and Inlets; American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc.; 2006.

D. SMACNA (DCS) - HVAC Duct Construction Standards - Metal and Flexible; Sheet Metal and Air Conditioning Contractors' National Association; 2005.

1.04 SUBMITTALS

A. See Section 01300 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

C. Project Record Documents: Record actual locations of air outlets and inlets.

1.05 QUALITY ASSURANCE

A. Test and rate air outlet and inlet performance in accordance with ASHRAE Std 70.

B. Test and rate louver performance in accordance with AMCA 500-L.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Kees: www.kees.com/security

A. Krueger: www.krueger-hvac.com.

B. Titus: www.titus-hvac.com.

2.02 PERFORATED FACE CEILING DIFFUSERS "A"

A. Type: Perforated face security diffuser.

B. Frame: Surface mount type with sleeve.

C. Fabrication: Steel with steel frame and white two part polyurethane finish.

D. Provide opposed blade dampers.

E. No opening in diffuser shall be larger than 3/16".

2.03 PERFORATED RETURN REGISTERS "B"

A. Type: Perforated face security grille.

B. Frame: Surface mount type with sleeve.

C. Fabrication: Steel with steel frame and white two part polyurethane finish.

D. Provide opposed blade dampers.

E. No opening in diffuser shall be larger than 3/16".

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Check location of outlets and inlets and make necessary adjustments in position to conform with architectural features, symmetry, and lighting arrangement.

C. Install diffusers to ductwork with air tight connection.

D. Provide balancing dampers on duct take-off to diffusers, and grilles and registers, despite whether dampers are specified as part of the diffuser, or grille and register assembly.

E. Paint ductwork visible behind air outlets and inlets matte black. Refer to Section 09900.

END OF SECTION

SECTION 26 01 26

ELECTRICAL ACCEPTANCE AND START- UP TESTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Acceptance and start-up testing requirements for electrical power distribution equipment and systems. Contractor shall retain and pay for the services of a recognized independent testing firm for the purpose of performing inspections and tests as herein specified.
   1. The testing firm shall provide all material, equipment, labor, and technical supervision to perform such tests and inspections.
   2. It is the purpose of these tests to assure that all tested electrical equipment is operational and within industry and manufacturers tolerances and is installed in accordance with design specifications.
   3. Tile tests and inspections shall determine suitability for start-up and energization.
   4. The following equipment shall be tested and calibrated:
      a. Protective relays, instruments, and metering systems.
      b. Grounding system and ground fault protection systems.
      c. Low voltage cables and feeders.

1.02 CODES, STANDARDS, AND REFERENCES

A. All inspections and tests shall be in accordance with the following codes and standards except as provided otherwise herein.
   1. National Electrical Manufacturers Association – NEMA
   2. American Society for Testing and Materials – ASTM
   3. Institute of Electrical and Electronic Engineers – IEEE
   4. InterNational Electrical Testing Association – NETA
      a. Acceptance Testing Specifications – ATS latest edition.
   5. American National Standards Institute – ANSI 02
      a. National Electrical Safety Code.
   6. State and Local Codes and Ordinances.
   7. Insulated Cable Engineers Association – ICEA
   8. Occupational Safety and Health Administration – OSHA
   9. Section 01400 Building System Commissioning Program.
   10. National Fire Protection Association – NFPA
      a. ANSI/NFPA 70: National Electrical
      b. ANSI/NFPA 78: Lightning Protection Code
      c. ANSI/NFPA 101: Life Safety Code

B. All inspections and tests shall utilize the following references.
   1. Project design specifications.
   2. Project design drawings.
   3. Manufacturers instruction manuals applicable to each particular apparatus.
   4. Project list of equipment to be inspected and tested.

1.03 QUALIFICATIONS OF TESTING FIRM

A. The testing firm shall be an independent testing organization which can function as an unbiased testing authority, professionally independent of the manufacturers, suppliers, and installers of equipment.

B. The testing firm shall be regularly engaged in the testing of electrical equipment devices, installations, and systems with at least five (5) years of documented experience.

C. The testing firm shall meet OSHA criteria for accreditation of testing laboratories, or be a full member company of the InterNational Electrical Testing Association (NETA) or qualified to be a member of NETA.

D. The lead on-site, technical person shall be currently certified by the InterNational Electrical Association (NETA) or National Institute for Certification in Engineering Technologies (NICET) in electrical power distribution system testing.

E. The testing firm shall utilize engineers and technicians who are regularly employed by the firm for testing services.

F. The testing firm shall submit proof of the above qualifications with bid documents when requested.

G. The terms used herewithin, such as test agency, test contractor, testing laboratory, or contractor Test Company, shall be construed to mean the testing firm.

1.04 SUBMITTAL

A. Provide submittal per Contract General Conditions, Division 1, and Section 26 05 10.

B. Qualification of testing firm.

C. Certified test reports.

D. Two copies of blank forms for checklists, test reports, and other related forms for Engineer's review and approval.

1.05 GENERAL REQUIREMENTS

A. Routine insulation-resistance, continuity, and rotation tests for all distribution and utilization equipment shall be performed, prior to and in addition to acceptance tests specified herein.

B. The testing firm shall notify the Engineer within 3 working days prior to commencement of any testing.

C. Any system, material, or workmanship which is found defective on the basis of Acceptance Tests shall be reported to the Engineer with corrective recommendations.

D. The testing firm shall maintain a written-record of all tests and, upon completion of project shall assemble and certify a final test report.

E. Test report.

1.06 SAFETY AND PRECAUTIONS

A. Safety practices shall include, but are not limited to the following requirements:
   1. Occupational Safety and Health Act.
   2. Accident Prevention Manual for Industrial Operations, National Safety Council.
   3. Applicable state and local safety operating procedures.
   4. Owners safety practices.
   5. National Fire Protection Association – NFPA 70A.
   6. American National Standards for Personnel Protection.

B. All tests shall be performed with apparatus de-energized. Exceptions must be thoroughly reviewed to identify safety hazards and devise adequate safeguards.

C. The testing firm shall have a designated safety representative on the project to supervise the testing operations with respect to safety.

D. Test Report:
   1. The test report shall include the following:
      a. Summary of project.

b. Listing of equipment tested.
c. Test results.
d. Recommendations.

2. Furnish copies of the complete report to the Engineer as directed in the contract documents.

1.07 INSPECTION AND TEST PROCEDURES

A. Contractor to provide the testing arm with a copy of related contract documents such as drawings, specifications, engineer reviewed submittals, coordination study report including all relay settings and other necessary information.

B. Contractor to supply a suitable source of power to each site per testing firm requirements.

C. Contractor shall notify the testing firm when equipment becomes available for acceptance tests. Work shall be coordinated to expedite project scheduling.

D. Testing firm to review and evaluate all received documents and notify Contractor and Engineer of any shortcoming documents and/or other requirements immediately.

E. Testing firm to provide and comply with the following:
1. Acceptance test procedures for each individual equipment listed on Part 1 of this section for Engineer review and approval prior to any test and after thorough evaluation of the system. Testing shall conform to the international Electrical Testing Association (NETA) specifications and standards for electrical power distribution equipment and systems and manufacturer's instructions.
2. Refer to each individual specification section for testing requirements and comply.
3. Inspect installed equipment and report any discrepancy and deficiency with contract documents and governing codes prior to testing.

1.08 SYSTEM FUNCTION TEST

A. Perform system function test upon completion of equipment test as defined in this section. It is the purpose of system function tests to prove the proper interaction of all sensing, processing, and action devices.

B. Implementation.
1. Develop test parameters for the purpose of evaluation performance of all integral components and their functioning as a complete unit within design requirements.
2. Test all interlocking devices.
3. Record the operation of alarms and indicating devices.

1.09 DEFICIENCIES

A. All deficiencies reported by testing firm to be corrected by Contractor and Acceptance Test to be re-done accordingly.

END OF SECTION

SECTION 26 05 10

GENERAL ELECTRICAL REQUIREMENTS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections.

B. All Specification Sections under Division 26.

1.02 SUMMARY

A. This Section includes:
1. Definitions.
2. Excavation.
3. Coordination of work.
4. Cleaning, patching repairing and painting.
5. Guarantees.
6. Field test.

1.03 REFERENCES

A. American National Standards Institute, Inc. (ANSI) Publications:
1. C2 - National Electrical Safety Code.
2. C37 – Metal-Enclosed Low-Voltage Power Circuit Breaker Switchgear.
3. C37 – Metal-Clad and Station-Type Cubicle Switchgear.
4. C37 – Metal-Enclosed Interrupter Switchgear.

B. California Code of Regulations (CCR) Publications:
1. Title 8, Industrial Relations.
2. Title 19, State Fire Marshal Regulations.
3. Title 24, Part 2, Energy Conservation Standards.
4. Title 24, Part 3, CCR, 2007 California Electrical Code.
5. Title 24, Part 9, CCR, 2007 California Fire Code.

C. National Electrical Manufacturers Association (NEMA) Publication: ICS6-93 Enclosures for Industrial Controls and Systems.

D. National Fire Protection Association (NFPA) Publications:
1. 70 National Electrical Code (NEC).
2. 70B Recommended Practice for Electrical Equipment Maintenance.
3. NFPA 101 Life Safety Code.

E. State of California Public Utilities Commission (Cal. P.U.C.) Publications:
1. G.O. 95 Rules for Overhead Electric Line Construction.
2. G.O. 128 Rules for Construction of Underground Electrical Supply and Communications Systems.

1.04 DEFINITIONS

The following definitions apply to terms used in these standards.

A. The words "work" or "electrical work" include products, labor, equipment, tools, appliances, transportation, and all related items directly or indirectly required to complete the specified and indicated electrical installation.

B. The world "concealed" shall meant that the installation will not be visible when all permanent or removable elements of the construction are in place. The word "exposed" shall mean that the

installation is visible when all permanent or removable elements of the construction are in place.

C. The word "code" shall mean any and all regulations and requirements of regulatory bodies, public and private, having jurisdiction over the work involved.

D. The word "product" used in Division 26 means all material, equipment, machinery, and/or appliances directly or indirectly required to complete the specified and/or indicated electrical work.

E. The words "standard product" shall mean a manufactured product, illustrated and/or described in catalogs or brochures, that is in general distribution prior to the date of issue of construction documents. Products will generally be identified by means of a specific catalog number and manufacturer's name.

F. "Provide" means furnish, install, connect and test unless otherwise noted.

G. The words "conduit" and "duct" are used interchangeably, and have the same meaning.

H. "UFER" Ground: See Section 26 05 29 , "Grounding and Bonding".

1.05 DRAWINGS AND SPECIFICATIONS:

A. Electrical drawings are diagrammatic but shall be followed as closely as actual construction and work of the other sections shall permit. Size and location of equipment is drawn to scale wherever possible.

B. Drawings and specifications are for the assistance and guidance of the Contractor. Exact locations, distances, and levels will b governed by the building. The Contractor shall make use of data in all the contract documents to verify information at the building site.

C. In any case where there appears to be a conflict or ambiguity between that which is shown on the electrical drawings or in the electrical specifications and any other part of the Contract Documents, the Contractor shall notify and secure directions from the Architect.

D. Drawings and specifications are intended to complement each other. Where a conflict or ambiguity exists between the requirements of the drawings and the specifications, request clarification. Do not proceed with work without direction.

E. The Architect shall interpret the drawings and the specifications. The interpretation by the Architect as to the true intent and meaning thereof and the quality, quantity, and sufficiency of the materials and workmanship furnished there under shall be accepted as final and conclusive.

F. In the case of conflicts or ambiguities not clarified prior to the bidding deadline, use the most costly alternative (better quality, greater quantity, and larger size) in preparing the bid. A clarification will be issued to the successful bidder as soon as feasible after the award and, if appropriate, a deductive change order will be issued.

G. Where items are specified in the singular, this division shall provide the quantity as shown on drawings plus any spares or extras indicated on the drawings or in the specifications.

H. RECORD DRAWINGS:

1. On one (1) set of contract drawings, kept at the site during construction, mark all work that is installed differently from that shown on plans, including revised circuitry, material or equipment. Sufficient dimensions shall be provided to locate all materials installed beneath and outside the building including, but not limited to, underground conduits, cabling, ground rods, and stubouts.
2. All changes or revisions to the contract drawings including, but not limited to, those indicate by amendment, change order, field order, written response to RFI/RFC or other contractual means shall be kept current as the work progresses and shall be incorporated onto the final record drawings.

3. Accurately locate and dimension all underground and embedded conduit runs on the record drawings.
4. The marked drawings shall be kept current as the work progresses and shall be available for inspection upon request. At the close of construction, prepare a set of accurate reproducible record drawings and turn them over to the Architect. The correct and completed record drawings are a prerequisite to final contract payment.
   a. As part of the reproducible record drawings, the Contractor shall produce full size reproducible drawings with the: Final panelboard schedules as modified during construction and final light fixture schedule as modified during construction.
   b. These drawings shall be on Architectural base sheets and numerically sequenced to follow the last "E" sheet.
5. As part of the reproducible record drawings, the Contractor shall produce full size reproducible drawings for all signal systems which shall include exact "As-Built" device locations, "As-Built" interconnection drawings, and "As-Built" riser diagrams, and provide one set in the panel board, motor control center, or main distribution panel.

1.06 EXAMINATION OF SITE:

A. Examination of the building site shall be made by the Contractor. The Contractor shall compare it with the drawings and specification and satisfy himself as to the conditions under which work is to be performed. The Contractor shall, at such time, ascertain and check the locations of existing structures or equipment which may affect his work.

1.07 EXCAVATION

A. Prior to starting excavation or trenching, the Contractor shall perform an underground Site Survey utilizing an electronic locator to verify the exact location of all existing underground utility piping, conduits and conductors. The Contractor shall submit for approval a site survey report to the Architect within five (5) working days after the survey is performed. The Site Survey Report shall show the horizontal location for existing utilities and identify any possible conflicts between the new work and existing utilities.

1.08 PERMITS, FEES AND INSPECTIONS:

A. Permits, fees, and inspections shall be arranged for and paid by the Contractor.

B. The Contractor shall present to the Architect, properly signed certificates of the final inspection before work will be accepted.

1.09 ELECTRO-MECHANICAL REQUIREMENTS:

A. The power wiring, safety switches, combination controllers (indicated on electrical plans), circuit breakers, and motor control equipment forming a part of motor-control centers or switchgear assemblies, and the electrical connection of the mechanical equipment to the electrical power source shall be included under Division 26.

B. The electrical components of mechanical equipment including, but not limited to, motors, motor-starters, control or pushbutton stations, float-pressure switches, solenoid valves, thermostats, junction boxes, and other devices functioning to control mechanical equipment shall be provided under Division 23. Interconnecting wiring for packaged equipment shall be provided as an integral part of the equipment.

C. Control Wiring: Installation of line and low voltage conduit, wiring and junction/outlet boxes not shown on the electrical drawings but required for controlling or monitoring mechanical equipment systems shall be furnished and installed under Division 23. Installation of these shall comply with the requirements of Division 26.

D. If substitution of controls or mechanical equipment other than that specified requires any changes in the electrical work from that shown on the plans or specified in Division 26, any additional cost of the equipment or electrical work shall be the responsibility of Division 23.

1.010 SUBMITTALS:

A. Submittal requirements for Division 26 shall be in accordance with Division 1 except as modified herein. All time requirements shall be based on the notice to proceed date of the General Contract. All materials and equipment furnished under Division 26 shall; be submitted to the Architect for approval. Such approval shall be in writing from the Architect including that which is exactly as specified. Any materials or equipment installed without written approval shall be subject to immediate removal. Approval of material or equipment shall in no way obviate compliance with the contract documents.

B. Submittals shall be packaged separately for each system or major piece of equipment and reviewed by the Contractor for verification of compliance with the contract documents prior to submitting to the Architect. Separate, bound submittals shall be provided for each specification section to the Architect. Authorization to combine equipment or systems must be in writing from the Architect. All interface between specification sections shall be indicated in each submittal.

C. All materials and equipment shall be new and shall bear the inspection label of the Underwriters Laboratories (UL) where applicable. Materials and equipment shall be the latest standard product and shall be of the grade indicated by the trade names given.

D. The work shown on the contract drawings is engineered and designed to accommodate the equipment described hereinafter in these specifications.

E. Equipment submittal shall include manufacturer's name, model, type, number, finish, size and capacity of the equipment at the given conditions. This information shall be provided in bound submittals, each containing an index and all submittals. Provide [seven (7)] copies of each submittal. The title shall provide the project name, system identity, the specification number, and the Contractor's name and address. This submittal shall be in addition to the shop drawings hereinafter specified. Partial submittals of material submitted from time to time are not acceptable and may be returned without review.

F. Submittals shall be reviewed by the Architect for compliance with the contract documents. Submittals found to be incomplete or not in compliance with the contract documents shall be returned for resubmittal. The Architect shall review the original submittal and one (1) resubmittal per section (if required). The Contractor shall reimburse the Architect for all subsequent submittal review.

G. Shop drawings for service entrance equipment shall be submitted to and approved by the San Diego Gas and Electric Company metering shop prior to submittal to the Architect and Plan Department.

H. Equipment Layout Drawings: "Equipment Layout Drawings" shall be provided for each equipment room, yard or area containing equipment items furnished under Division 16. Layout drawings shall consist of a plan view of the room or area (to a ¼ inch =1 foot – 0 inch minimum scale) showing projected outlines of all equipment, complete with dotted lines indicating all required clearances, including all clearances needed for removal or service. Location of all conduit and pull boxes shall be indicated. Drawings shall indicate any and all conflicts with other trades.

1.011 SUBSTITUTIONS:

A. Equipment submitted for substitution must fit the space conditions shown on the drawings, leaving adequate room for maintenance around all equipment. A minimum of 48 inches (or more if required by Code) must be maintained clear in front of all electrical panels, starters, gutters or other electrical apparatus. Submit drawings showing the layout, size, and exact method of interconnection of conduit, wiring and controls, which shall conform to the manufacturer's recommendations and these specifications. The scale of these drawings shall be the scale of the contract drawings. The Contractor shall bear the excess costs, by any and all crafts, for fitting the equipment into the space and the system designated. Where additional

labor or material is required to permit equipment submitted for substitution to function in an approved manner, this shall be furnished and installed by the Contractor without additional cost to the Owner.

B. No substitutions will be allowed for materials or equipment if three (3) or more manufacturers are indicated.

C. An item submitted for substitution does not constitute an "equal" unless approval by the Architect has been given in writing.

D. Equipment submitted for substitution shall be approved in writing by the Architect and shall be accompanied by the following:
   1. A sample of each item submitted for substitution shall accompany the submittal if requested by the Architect.
   2. A unit price quotation shall be provided with each item intended for substitution. This quote shall include a unit price for the specified item and a unit price for the intended substitute item. The Contractor shall also provide a total (per item) of the differential payback to the Owner should the intended substitute item be approved as equivalent to that which is specified.
   3. The Contractor shall reimburse the Owner for the additional services required by the Architect to review and process substitutions.

E. Substitutions shall be approved in writing by the Architect. The determination of the Architect shall be final.

1.012 WARRANTY:

A. Warranty requirements for Division 16 shall be in accordance with Division 1 except as modified herein.

B. All materials and equipment provided shall be warranted for a minimum period of one (1)-year from the official date of completion. In addition, provide two (2)-year extended warranty, for a total of three (3)-years, for the following items:
   1. Service Entrance and Metering Equipment.
   2. Distribution Switchboards.
   3. Disconnect Switches.
   4. Panelboards.
   5. Circuit Breakers.
   6. Motor Starter, Motor Controllers and Motor Control Centers (all components).

C. The Contractor shall provide all labor and materials required to correct problems which develop during the warranty period due to defective materials of faulty workmanship. The labor and materials to do this work shall be provided at no additional cost to the Owner.

D. Within one (1)-month prior to the expiration of the warranty period, the Contractor shall correct any and all defects covered by the warranty. This shall include tightening to original specifications of all bolted connections.

E. Warranty certificates shall be made out to San Diego Unified School District and shall be delivered to the Architect at the completion of the installation.

F. All equipment shall be guaranteed to be supported in such a way as to be free from objectionable vibration and noise.

G. Additional warranty requirement shall be as indicated in the following sections of Division 16.

H. Refer to Section 01700 to warranty format.

1.013 OPERATION AND MAINTENANCE MANUALS:

A. The Contractor shall furnish operation and maintenance manuals for each electrical system and for each piece of equipment. The complete manual, bound in hardback binders, or an approved equivalent, shall be provided to the Architect. Provide Seven (7) copies of each manual. One (1) manual shall be furnished prior to the time that system or equipment tests are performed, and the remaining manuals shall be furnished one (1) week before the final job visit is made. The following identification shall be inscribed on the cover; the words "OPERATION AND MAINTENANCE MANUAL", the name and location of the building, the name of the Contractor, and the contract number.

B. The manual shall include the names, address, and the telephone numbers of each Subcontractor installing equipment and systems, and of the local representatives for each item of equipment and each system. The manual shall have a table of contents and be assembled to conform to the table of contents with tab sheets placed before instructions covering each subject. The instruction sheet shall be legible with large sheets of drawings folded in. The Manual shall include, but not limited to , the following:
   1. System layout showing components.
   2. Devices and controls.
   3. Wiring and control diagrams showing operation and control of each component.
   4. Sequence of operation describing start-up, operation, and shutdown.
   5. Functional description of the principal system components.
   6. Installation instructions.
   7. Maintenance and overhaul instructions.
   8. Lubrication schedule including type, grade, temperature, range, and frequency.
   9. Safety precautions, diagrams and illustrations.
   10. Test procedures.
   11. Performance data.
   12. Parts list.

C. The parts list for equipment shall indicate the sources of supply, recommended spare parts, and the service organization which is reasonably convenient to the building sit. The manual shall be complete in all respects for all equipment, controls, and accessories provided.

1.014 COORDINATION OF ALL WORK:

A. Job Visits by the Architect:
   1. Periodic visits to the job by the Architect are for the express purpose of verifying compliance with the contract documents.
   2. Such visits shall <u>not</u> be construed as construction supervision. Neither shall such visits be construed as making the Architect responsible for providing a safe place for the performance of the work by the Contractor or the Contractor's employees or the safety of the supplies of the Contractor or his Subcontractors.

B. Temporary Electrical Service:
   1. The Contractor shall provide labor and materials required for the installation and maintenance of temporary lighting and required power sources for the Contractor's equipment inside the building or construction site and for pedestrian walkways during the period of construction.
   2. The building or construction site shall be sufficiently illuminated so that construction work can be safely performed. Special attention shall be given to adequately lighting stairs, ladders, pedestrian walkways, floor openings, etc. Walkway lights shall be controlled by a switch within the building or construction site.
   3. Power shall be on and all lighting shall be in operation before painting work commences.

C. Electrical Service Outages:
   1. There shall be no interruption of existing electrical service without prior approval by the Architect. Written notice of proposed utility outages shall be delivered to the Architect at least fourteen (14)-days prior to the start of the proposed outage. The interruption of electrical service shall be scheduled outside the normal working hours. The maximum

outage time shallow shall be four (4)-hours, otherwise, the Contractor shall be responsible for all related work including, but not limited to, installation of new electrical lines, abandonment of existing electrical lines, and interfacing between new and existing lines to ensure uninterrupted service. Additional requirements are listed in Division 1 of this specification.

2. The installation shall be closely coordinated with the utility provider and all other site utilities.

D. New Utility Services:
   1. The Contractor shall provide all required labor and material for the installation and connection of new utility services including, but not limited to the following:
      a. Electrical
      b. Telephone
      c. Cable Television

E. Posted Operating Instructions:
   1. Operating instructions shall be provided by the Contractor at the conclusion of the project for each system and each principal piece of equipment for the use of operating and maintenance personnel. The operating instructions shall include wiring and control diagrams showing the entire system, including, but not limited to, equipment, devices, and control sequences. All operating instruction shall be approved by the Architect.
   2. Operating instructions shall be typewritten or engraved and shall be framed under glass or in approved laminated plastic and posted adjacent to each principal piece of equipment and shall include such instructions as start up, proper adjustment, operation, lubrication, shutdown, safety-precautions, procedure in the event of equipment failure, and any other necessary items of instructions as recommended by the manufacturer of unit.
   3. Operating instructions exposed to the weather shall be made of weather-resisting materials or shall be suitably enclosed to be weather protected. Operating instructions shall not face when exposed to sunlight and shall be secured to prevent easy removal or peeling.

1.015 TRAINING:

A. User staff and maintenance personnel shall be thoroughly trained (minimum four (4)-hours) in the use of each system or major piece of equipment installed. This training shall be provided a part of the Contractors bid to supply the system or equipment. Additional training requirements, shall be as specified in the subsequent sections of Division 26.

1.016 DELIVERY AND STORAGE:

A. Equipment and materials shall be properly stored, adequately protected, and carefully handled to prevent damage before and during installation. Equipment and materials shall be handled, stored, and protected in accordance with the manufacturer's recommendations and as approved by the Architect. Electrical conduit shall be stored to provide protection from the weather and accidental damage. Plastic conduit shall be stored on even supports and in locations not subject to direct sunrays or excessive heat. Cables shall be sealed, stored, and handled carefully to avoid damage to the outer covering or insulation and damage from moisture and weather. Damaged or defective items shall be replaced with new items a no cost to the Owner. The Architect shall determine if a damaged or defective item is to be replaced with a new item. The decisions by the Architect in these matters shall be final.

1.017 FIELD TESTS:

A. As an exception to requirements that may be stated elsewhere in the contract, the Architect shall be given five (5) working days notice prior to each test. The Contractor shall provide all test equipment, personnel and incidentals including, but not limited to, water, fuel, and lubricants necessary to perform the required tests. The Owner shall provide electrical power

required for all tests. The Contractor shall submit five (5) typewritten copies of all test results to the Architect within five (5) working days after each test.

1. The information submitted shall include, but not limited to, the following:
   a. Scope of the test.
   b. Name and type of instrument used.
   c. Calibration date of instrument and name of calibration firm.
   d. Name and signature of testing personnel.
   e. Name of signature of Architect.
   f. Analysis of test results.
2. The Contractor shall demonstrate to the Architect the operation of all equipment and systems. All tests shall be completed to the satisfaction of the Architect. Each test shall be performed the number of time indicated in the individual specification section. In the event the number of times the tests are to be completed is omitted, the Architect shall determine the number.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 26 05 12

BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections.

B. All specification Sections under Division 26.

1.02 SUMMARY

A. This Section includes the following:
1. Raceways.
2. Building wire and connectors.
3. Supporting devices for electrical components.
4. Wiring Devices.
5. Safety Switches.
6. Electrical identification.
7. Electricity-metering components.
8. Concrete equipment bases.
9. Electrical demolition.
10. Cutting and patching for electrical construction.
11. Touch-up painting.
12. Tests of all electrical systems.
13. Unit price quotations.

1.03 ABBREVIATIONS

A. EMT: Electrical metallic tubing.

B. FMC: Flexible metal conduit.

C. IMC: Intermediate metal conduit.

D. LFMC: Liquid tight flexible metal conduit.

E. RNC: Rigid nonmetallic (PVC) conduit.

F. RMC: Rigid metallic conduit.

1.04 REFERENCES

A. American National Standards Institute, Inc. (ANSI) Publications:
1. C80.1 – Rigid Steel Conduit, Zinc Coated (GCR).
2. C80.3 – Electrical Metallic Tubing, Zinc Coated (EMT).
3. AB 1 – Molded Case Circuit Breakers.
4. ICS 2 – Industrial Controls and Systems: Controllers, Contactors and Overload Relays, Rated Not More than 2000 Volts AC or 750 Volts DC.
5. ICS 6 – Industrial Controls and Systems: Enclosures.
6. KS 1 – Enclosed Switches and Miscellaneous Distribution Equipment Switches (600 Volts).
7. PB 1.1 – General Instructions for proper Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.
8. TC 2 – Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80).
9. VE 1 – Metallic Cable Tray Systems.
10. VE 1 – General Requirements for Wiring Devices.

11. WD 6 – Wiring Device Dimensional Requirements.

B. National Fire Protection Association (NFPA) Publication 70 – National Electrical Code (NEC).

C. California Code of Regulations (CCR) Publications:
1. Title 24, Part 2, Energy Conservation Standards.
2. Title 24, Part 3, CCR, California Electrical Code.

D. Uniform Building Code (UBC) (Zone IV)

E. Underwriters Laboratories, Inc. (U.L.) Publications
1. Standard for Flexible Metal Conduit.
2. Rigid Metallic Conduit.
3. Cabinet and Boxes.
4. Panelboards.
5. Thermoplastic Insulated Wires.

F. National Electrical Manufacturers Association – Wiring Devices (NEMA WD).

1.05 SUBMITTALS

A. The following information shall be submitted for review and approval in accordance with Section 16010, "General Electrical Requirements".

B. Shop Drawings:
1. Provide shop drawings for each nameplate, tag and label indicating fabrication details and text.
2. Provide shop drawing details, furnished by the manufacturer of the fire shop material, which show complete conformance to the U.L. system listing. These drawing shall be available to the Fire Marshal on site. The shop drawing shall be specific for each penetration with all variables defined.

C. Field Test Reports: Indicate and interpret test results for compliance with performance requirement

D. Class R Fuses

E. Liquid-Tight Flexible Steel Conduit

F. 486A Wire Connectors and Soldering Lugs, for use with Copper Conductors

G. 498 Attachment Plugs and Receptacles

H. 508 Insulating Tape

I. 514 Metallic Outlet Boxes

J. 514B Fittings for Conduit and Outlet Box

K. 652 Schedule for 40 & 80 Rigid PVC Conduit

L. 797 Electrical Metallic Tubing

M. 869 Reference Standard for Service Equipment

N. 870 Wireways, Auxiliary Gutters, and Associated Fittings

O. 1242 Standard for Intermediate Metal Conduit

P. 1660 Liquid-Tight Flexible Nonmetallic Conduit

1.06 REGULATORY REQUIREMENTS

A. The Contractor shall conform to the requirements of ANSI/NFPA 70 and with all State-adopted amendments, except where requirements herein are more stringent.

B. The Contractor shall furnish products listed and classified by Underwriters Laboratories, Inc. or as testing firm acceptable to the District as suitable for purpose specified and shown.

1.07 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

1.08 COORDINATION

A. Coordinate chases, slots, inserts, sleeves, and openings with general construction work and arrange in building structure during progress of construction to facilitate the electrical installations that follow.
   1. Set inserts and sleeves in poured-in-place concrete, masonry work, and other structural components as they are constructed.

B. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the Work. Coordinate installing large equipment requiring positioning before closing in the building.

C. Coordinate electrical service connections to components furnished by utility companies.
   1. Coordinate installation and connection of exterior underground and overhead utilities and services, including provision for electricity-metering components.
   2. Comply with requirements of authorities having jurisdiction and of utility company providing electrical power and other services.

D. Coordinate location of access panels and doors for electrical items that are concealed by finished surfaces. Access doors and panels are specified in Division 8 Section "Access Doors" and D5010 Electrical Service & Distribution.

E. Where electrical identification devices are applied to field-finished surfaces, coordinate installation of identification devices with completion of finished surface.

F. Where electrical identification markings and devices will be concealed by acoustical ceilings and similar finishes, coordinate installation of these items before ceiling installation.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Products and materials shall be as specified in the pertinent sections of Division 16:
   1. Conduit:
      a. Rigid Metallic Conduit (Zinc-coated): ANSI C80.1, UL 6, hot-dip galvanized, threaded type.
      b. Electrical Metallic Tubing: UL 797, ANSI C80.3.
      c. Rigid Non-metallic Conduit: NEMA TC-2, UL 651, PVC Schedule 40, Carbon or approved equal.
      d. Liquid-tight Flexible Non-Metallic Conduit: UL 1660, Non-metallic, liquid tight conduit with a polyvinyl chloride reinforced core. Conduit must conform to NEC 351B. Manufacturer: Electri-Flex Liquatite type LNM-P, Kellems Polytuff I or approved equal.
      e. Flexible Metal Conduit: UL 1.
   2. Fittings:
      a. Fittings for Rigid Metallic Conduit: UL 514B, threaded-type.
      b. Fittings for EMT: Compression type. Split or set-screw couplings shall not be used.
      c. Fittings for Liquid-tight Flexible Non-Metatallic Conduit: ANSI/NEMA FB1.
      d. Fittings for Flexible Metal Conduit: ANSI/NEMA FB 1.

e. Expansion/Deflection Fittings: The Contractor shall provide OZ Gedney Type AXDX fittings capable of straight line expansion movement in accordance with UBC, Zone IV. Fittings shall be complete with grounding and bonding jumpers.

3. Conductors:
   a. Conductors shall bear the date of manufacture imprinted on the insulation with other identification.
   b. 600 Volts wires and Cables: UL 83. Conductors, sized No. 8 and larger, shall be stranded copper. Insulation shall be type THHN/THWN unless otherwise noted.
   c. Color Coding: Color shall be green for grounding conductors and white for neutrals. Where neutrals of more than one system are installed in the same raceway or box, other neutral shall be white with colored (not green) stripe. Color of ungrounded conductors in different voltage systems shall be as follows:
      1) 208Y/120 volt, 3∅
         a) Phase A – black
         b) Phase B – red
         c) Phase C – blue
         d) Neutral – white
         e) Grounding Conductor - green
      2) 480Y/277 volt, 3∅
         a) Phase A – brown
         b) Phase B – orange
         c) Phase C – yellow
         d) Neutral – white
         e) Grounding Conductor - green
   d. Minimum size for branch circuits shall be No. 12 AWG, unless otherwise noted.
   e. EMS Cables: 2/C #18 tinned copper, polyethylene insulated, twisted pair, foil aluminum polyester shield, 20 AWG stranded tinned copper drain wire, chrome PVC jacket, Belden Trade Number 8760 or approved equal.
4. Outlet Boxes:
   a. Sheet Metal Outlet Boxes: ANSI/NEMA OS 1, galvanized steel.
   b. Non-metallic Outlet Boxes: ANSI/NEMA OS 2.
5. Receptacles:
   a. UL 498 and NEMA WD. Receptacles shall be NEMA 5-20R unless otherwise indicated on the drawings.
   b. Acceptable manufacturers: Hubbell, Pass & Seymour, Sierra.
6. Switches:
   a. NEMA WD. General purpose wall switches shall be heavy-duty, 20 A, 277V AC, general use snap switch with ivory handle.
   b. Switches shall be single pole, 2-pole, 3-way, 4-way, momentary contact, weatherproof, lock or other type switches indicated.
   c. Acceptable manufacturers: Hubbell, Pass & Seymour, Sierra.
7. Device Plates:
   a. Plates shall be UL listed, one-piece device plates for all wiring devices and for outlet boxes used as junction or pull boxes.
   b. Plates shall be stainless steel, type 302/304 with satin finish, having round or smooth edges.
   c. Plates installed in wet locations shall be gasketed and UL listed for "wet locations".
8. Cabinets:
   a. UL 50.
   b. Cabinets shall be constructed of cold-rolled drawing quality steel, with metal gages and construction methods conforming to National Electrical Code requirements, and Underwriters Laboratories' standards.
   c. Cabinets shall be 12 gauge G-90 grade galvanized steel minimum, unless otherwise noted.

9. Junction Boxes and Pull Boxes:
   a. UL 50.
   b. Pull and junction boxes shall be constructed of Code gauge steel and sized as indicated or required.
   c. The contractor shall provide 16 gauge steel minimum, unless otherwise noted.
   d. Indoor enclosures shall conform to NEMA ICS 6 for the type 1, unless otherwise noted.
10. Safety Switches:
   a. NEMA KS 1.
   b. Switches serving as motor-disconnect shall be horsepower rated. The Contractor shall provide heavy-duty type switches where indicated, where switches are rated higher than 240 volts, and for double-throw switches.
   c. Fused switches shall utilize Class R fuseholders and fuses unless indicated otherwise.
   d. Unless otherwise indicated, the Contractor shall provide indoor switches in NEMA Type 1 enclosure, per NEMA ICS 6, and outdoor switches in NEMA Type 3R enclosure, per NEMA ICS 6.
11. Wire Connectors and Terminals:
   a. For use with copper conductors. UL 486A.
12. Insulating Tapes:
   a. UL 510.

B. All products and materials shall be new and bear UL label whenever subject to such approval. Comply with ANSI, IEEE and NEMA standards where applicable.

C. Wherever possible, all materials and equipment used in this installation shall be of the same manufacturer throughout for each class of material or equipment.

2.02 ELECTRICAL IDENTIFICATION

A. Identification Devices: A single type of identification product for each application category. Use colors prescribed by ANSI A13.1, NFPA 70, and Division 26 05 53 Electrical Identification.

B. Raceway and Cable Labels: Comply with ANSI A13.1, Table 3, for minimum size of letters for legend and minimum length of color field for each raceway and cable size.

C. Nameplates, Tags, and Labels:
   1. Furnish and install 1-inch (high) minimum by 3-inch (wide) minimum by 3/32 inch (thick) matte black (for normal power) and red (for emergency power), laminated phenolic nameplates with ¼ inch white characters engraved in the plastic for all items of electrical equipment including, but not limited to, switchboards, panelboards, automatic transfer switches, motor control centers, feeder circuit breakers, relays, time switches, disconnect switch, exposed pull or junction boxes, and all control equipment. Name plates shall be attached with two (2) cadmium-plated screws. Adhesive attachment will not be acceptable. Punch strip tape type nameplates with card holders in any form are prohibited.
   2. Branch circuits shall be tagged in the outlet boxes, panelboards, and in all junction boxes where circuits terminate. Feeders shall be tagged at each end. Tags shall be applied immediately after wire is installed.
   3. Each branch circuit device coverplate shall be labeled (engraved or silk screen) to indicate the branch circuit. Devices shall include, but no be limited to, the following:
      a. Toggle/Rocker Switches,
      b. Receptacles,
      c. Panelboards

2.03 FIRE RESISTIVE PENETRATION:

A. All penetrations of fire resistive floor, walls or ceilings shall be protected by materials and installation details that conform to U.L. (Underwriters' Laboratory) listings for through

penetration fire stop systems. This includes, but is not limited to, all raceway penetrations and electrical outlet boxes recessed in opposite sides of rated walls with less than a 24 inches horizontal offset. The material used shall be 3M brand #CP-25 N/S caulk, #303 putty or equal.

2.04 EQUIPMENT FOR UTILITY COMPANY'S ELECTRICITY METERING

A. Current-Transformer Cabinets: Comply with requirements of electrical power utility company.

B. Meter Sockets: Comply with requirements of electrical power utility company.

C. Modular Meter Centers: Factory-coordinated assembly of a main meter center circuit-breaker unit with wireways, tenant meter socket modules, and tenant branch circuit breakers arranged in adjacent vertical sections, complete with interconnecting buses.
   1. Housing: NEMA 250 enclosure/type 1 – indoor and type 3R outdoor.
   2. Tenant Branch Circuit Breakers: Series combination rated to protect circuit breakers in downstream panelboards that have 10,000-A interrupting capacity, minimum.

2.05 EQUIPMENT FOR ELECTRICITY METERING BY OWNER

A. Meter: Electronic kilowatt-hour measuring to record electricity used.

B. Meter: Electronic kilowatt-hour/demand measuring to record electricity used and highest peak demand over a time period according to electric utility. Meter is designed for use on the type and rating of circuit indicated for its application.
   1. Kilowatt-Hour Display: Digital liquid crystal.
   2. Kilowatt-Demand Display: Digital, liquid-crystal type to register highest peak demand.
   3. Enclosure: NEMA 250, Type 1, minimum, with hasp for padlocking or sealing.
   4. Memory Backup: Self-contained to maintain memory throughout power outages of 72 hours, minimum.
   5. Sensors: Current-sensing type, with current or voltage output, selected for optimum range and accuracy for the ratings of the circuits indicated for this application.
   6. Accuracy: Nationally recognized testing laboratory certified to meet ANSI C12.1 specifications.
   7. Demand Signal Communication Interface: Match signal to building automation system input that conveys data on instantaneous/integrated demand level measured by meter used for load switching to control demand.

C. Current-Transformer Cabinets: Listed or recommended by metering equipment manufacturer for use with sensors indicated.

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

E. Metering Equipment Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. E-MON Corporation.
   2. National Meter Industries, Inc.
   3. Osaki Meter Sales, Inc.

2.06 CONCRETE BASES

A. Concrete Forms and Reinforcement Materials: As specified in Division 3 Section "Cast-in-Place Concrete."

B. Construct concrete bases of dimension indicated, but not less than 4 inches (100 mm) larger, in both directions, than supported unit. Follow supported equipment manufacturer's anchorage recommedations and setting templates for anchor-bolt and tie locations, unless otherwise indicated. Use 3000-psi (20.7-Mpa), 28-day compressive-strength concrete and reinforcement as specified in Division 3 Section "Cast-In-Place Concrete".

2.07 TOUCHUP PAINT

A. For Equipment: Equipment manufacturer's paint selected to match installed equipment finish.

B. Galvanized Surfaces: Zinc-rich paint recommended by item manufacturer.

PART 3 EXECUTION

3.01 INSTALLATION AND CONNECTION OF ELECTRICAL EQUIPMENT:

A. Equipment furnished by others shall be completely connected to the electrical system as required for correct operation. All conduit, wire, junction boxes, etc., shall be provided for proper connection and all required grounding shall be installed. Verify actual requirements with equipment supplier or Architect prior to rough- in.

B. All outlets, devices and equipment furnished under Division 16 shall be fully installed and connected.

C. Provide all required flexible conduit, boxes, fittings, receptacles, caps, cords, and other material that may be required for the proper installation of all equipment. Refer to manufacturer's directions where applicable.

D. Coordinate the work carefully to ensure that all electrical requirements of equipment are met and all systems are made complete and operational.

E. All equipment shall be installed recessed (flush) unless otherwise noted or shown on plans.

F. Devices installed recessed in opposite sides of fire walls shall comply with C.B.C. 4304 (minimum horizontal offset shall be 24 inches between openings) or shall be protected in accordance with paragraph 2.3 above. If this requirement creates a conflict with the layout of devices on the drawings, request clarification from the Architect.

G. After "rough-in" and prior to installation of conduit, wiring, or wall material, the Contractor shall accommodate changes in device locations of up to ten (10) linear feet at no additional charge. Do not proceed beyond "rough-in" without approval of the Architect.

H. Arrange for necessary openings to allow entry of equipment.
   1. Where equipment cannot be installed as structure is being erected, provide for and arrange for building-in of boxes, sleeves or other devices to allow later installation.

I. Make all penetrations through roofs prior to installation of roofing. For penetrations required after installation of roofing:
   1. In built-in roofing (BUR), provide all curbs, cants and base flashings in accordance with manufacturer's recommendations.
   2. In elastic sheet roofing (ESR), arrange and pay for flashing work by a skilled roofer in accordance with manufacturer's recommendations.

J. Install rain hoods and metal counter flashings as indicated and make all penetrations of electrical work through walls and roofs water and weathertight.
   1. Where metal flashings are applied over concrete, paint concrete with 1/8 inch (3 mm) of mastic cement first.
   2. Set flashing in mastic cement, watertight.

K. Have repair and replacement of roof construction, damaged by this project, done in a manner which will not nullify roof warranty.

L. Provide equipment guards at all belts, couplings, moving machinery and equipment provided under this Division.
   1. Use suitable structural frames with 12 GA (2.7mm), ¾ inch (18 mm) maximum opening galvanized mesh, or expanded metal mesh.
   2. Attach to equipment by removable slips and bolts with wing nuts, or other approved connectors.

M. Install equipment to permit easy access for all maintenance.

1. Maintain easy access to switches, motors, drives, pull boxes, receptacles, etc.
2. Relocate items which interfere with access.

N. Provide concrete foundations or pads for all floor mounted electrical equipment.
1. Provide as indicated or as follow:
   a. Where drawings do not show special foundations, install 4 in. high concrete pads.
   b. Use 3,000 PSI (14Kg/s/mm) concrete.
   c. Reinforce with 6 x 6 inches W2.9 X W2.9, 10 GA (3.4mm) mesh, with short dowels into floor at 12 inches OC around perimeter.
   d. Chamfer top edges ¾-inch (18mm).
   e. Make all faces smooth.
   f. Set anchor bolts for equipment. Conform locations with equipment manufacturer.

3.02 SEISMIC RESTRAINTS:

A. All electrical equipment shall be braced or anchored in accordance with the requirements of UBC, Seismic Zone IV.
1. Horizontal seismic forces shall be determined from the applicable equations of the governing code.
2. Provide all required seismic bracing, supports, bolts, washers, nuts, etc. for conduits and conduit supports.
3. Provide an independent system to secure all recessed lighting fixtures. Fixtures shall be supported directly and laterally from the building structure above, using No. 9-gauge wire minimum. The ceiling suspension system shall not be used for direct support.

3.03 MISCELLANEOUS WORK:

A. Do all miscellaneous metal and concrete work required; all cutting and patching; and provide all hangers, anchors, chases, supports, etc., required for the installation of the electrical systems.

B. Touch-up or refinish damaged surfaces including, but not limited to, panelboards, transformers, etc., to the satisfaction of the Architect.

C. Provide "As-Built" panel schedules and labels on all existing equipment affected by this project including, but not limited to, the following:
1. Main Switchboards.
2. Disconnect Switches.
3. Panelboards.
4. Distribution Panelboards.

D. All work shall be in accordance with applicable sections of the specifications.

3.03 CLEANING AND PROTECTION OF PRODUCTS AND PREMISES:

A. At Frequent intervals during the time on the site, the Contractor shall clean up after his work and remove his debris from the premises. The building and grounds shall be cleaned to the satisfaction of the Architect. All equipment and material resulting from demolition for this project shall be removed.

B. The Contractor shall take all necessary precautions to protect all materials, equipment and property, whether electrical or not, from damage as result of his work.

C. The Contractor shall provide adequate protection for all material and equipment provided under Division 26. Material and equipment shall be stored in a clean dry place and shall be covered or protected from damage or contamination during storage and after installation.

D. Before final inspection, all material and equipment furnished under Division 26 shall be thoroughly cleaned of cement, plaster, pain spatters and other foreign materials. All surfaces shall be carefully wiped clean. Boxes, cabinets and enclosures shall be cleaned, inside and out.

3.04 DEVICE LOCATIONS:

A. The Following dimension for locating wall mounted (recessed or surface) devices represent the distance from the finished floor to the center of the device unless otherwise shown on plans or drawings. Coordinate device locations with all architectural millwork and/or casework elevations. Coordinate device mounting height with wainscoting where provided. Where top of wainscot and device mounting height overlaps, shift device down to provide 2-in. gap between top of device and top of wainscot. Outlet boxes shall be within ¼-inch of the finished wall surface except that boxes for flush plates shall not protrude beyond the wall surface.

1. Telecom Outlets
   a. General for Desk Phone +18 inches
   b. Wall Phone +46 inches
   c. Data Outlet +18 inches
   d. Multi-drop +18 inches
2. Convenience Outlets
   a. General Wall +18 inches
   b. Mechanical or Electrical +46 inches

      Equipment Rooms +18 inches
   c. Electric Water Cooler outlet or Center on unit where accessible junction boxafter unit is installed
   d. Above Counter or Backsplash +4 inches
3. Light Switch or Dimmer +46 inches
4. Clock Outlet +84 inches
5. Fire Alarm Pull Station +46 inches
6. Fire Alarm Audio Devices +90 inches
7. Fire Alarm Visual Devices +80 inches or 6 inches

   Combination Audio/Visual Devices below finished ceiling, whichever is lower
8. Television Outlet
   a. General for Console TV +18 inches
   b. Wall Mounted Television +44 inches
9. Light fixtures – Accessible for maintenance without special equipment required.

B. All devices shall be square and level with no gaps around the trim.

C. Adjacent devices, mounted at the same elevation, shall be provided with a single, common trimplate.

3.05 CHECKING AND TESTING OF EQUIPMENT:

A. Switchboards, panelboards, disconnects, and all other operable equipment worked on under this contract shall be inspected for defects, and tested for proper operation.

B. Systems shall be tested for short circuits, open circuits, wrong connections, and grounds. All system shall be free from mechanical and electrical defects.

C. Circuits shall be tested for proper neutral and ground connections.

D. Where required or directed, systems shall be tested in the presence of the Architect to demonstrate that equipment furnished, installed, or connected functions in the manner intended.

E. The contractor shall furnish all necessary instruments and equipment required for testing and shall immediately correct any defective work at no additional charge. Should the Contractor refuse or neglect to make tests necessary to satisfy the Architect that he has carried out the

true intent and meaning of the specifications, the Architect may have such tests made and charge the expense thereof to the Contractor to be retained out of full final payment.

F. Bolted connections shall be torque-tightened to manufacturer's specifications. The Contractor shall torque all connections with a wrench that has been calibrated within the last three (three) months. Submit proof of calibration to the Owner's Representative.

G. Ground-Fault Circuit Interrupter Tests: Test each branch circuit having ground fault circuit protection to ensure that the ground fault circuit interrupter will not operate when subjected to a ground fault current of less than 4 milliamperes and will operate when subjected to ground fault current exceed 6 milliamperes. Perform tests using an instrument specifically designed and manufactured for testing ground fault circuit interrupters. Apply the test to the receptacle which is the greatest distance from the ground fault interrupter. If ground-fault interrupter type receptacles are installed, test each receptacle for proper operation. "TEST" button operation will not be acceptable as a substitute for this test.

H. For additional checking and testing of special systems, see the section where those systems are specified.

END SECION

SECTION 26 05 19
WIRES AND CABLES

PART 1 GENERAL

2.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Section 26 05 12– Basic Electrical Materials and Methods.

C. Section 26 27 26 – Wiring Devices.

D. Section 26 05 10 – General Electrical Requirements.

2.02 SUMMARY

A. This Section includes building wires and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.

2.03 REFERENCES

A. OUSD Standards and Design Guide.

B. NEC (National Electrical Code) and California Electrical Code.

C. NECA (National Electrical Contractors Association) – Standard of Installation.

D. NETA (International Electrical Testing Association) – Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

E. AVSI/UL – Insulation of Conductors.

2.04 SUBMITTALS

A. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

B. Product data: Submit for building wire and each cable assembly type.

C. Select each length to complete set of manufacturer markings.

D. Attach tag indicating cable size and application information.

E. Product Record Documents: Record actual locations of components and circuits.

F. Provide manufacturer's instruction for use of ground megger with proposed method indicated.

2.05 QUALITY ASSURANCE

A. Manufacturer: Shall be specialized in manufacturing products specified in this section with minimum ten years (documented) experience.

B. Testing Agency: Company shall be a member of International Electrical Testing Association and specializing in testing products specified in this section with minimum three years.

C. Listing and Labeling: Provide wires and cables specified in this Section as defined in NEC, Article 100.

2.06 REGULATORY REQUIREMENTS

A. Conform to ANSI/NFPA 70.

B. Conform to CCR Title 24, Part 6, California Energy Code.

2.07 DELIVERY, STORAGE, AND HANDLING

A. Product Requirements: Products storage and handling requirements.

B. Deliver wires and cables according to NEMA WC 26.

2.08 SCHEDULING OR COORDINATION

A. Division 1 – Administration Requirements: Requires for coordination.

B. Where wire and cable destination is indicated and routing is not shown, determine routing and lengths required.

C. Coordinate layout and installation of wiring and cables with other installations.

PART 2 PRODUCTS

2.01 MANUFACTURERS

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

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Wires and Cables:
      a. Alcan Aluminum Corporation; Alcan Cable Div.
      b. American Insulated Wire Corp.; Leviton Manufacturing Co.
      c. Carol Cable Co., Inc.
      d. Senator Wire & Cable Company.
      e. Southwire Company.
   2. Connectors for Wires and Cables:
      a. AMP Incorporated.
      b. General Signal; O-Z/Gedney Unit.
      c. Monogram Co.; AFC.
      d. Square D Co.; Anderson.

2.02 BUILDING WIRES AND CABLES

A. Conductor Material: Copper

B. All conductor sizes shall be designated by American Wire Gauge (AWG) or Million Circular Mills (MCM).

C. The date shall not exceed six months prior to delivery to the site.

D. All conductors smaller than No. 8 AWG should be solid. All conductors larger than No. 8 AWG shall be stranded. Minimum wire size shall be No. 12, unless otherwise specified.

E. Inside building branch circuit conductors shall be type THWN (75 degrees C) except that type THHN (90 degrees°C) conductors shall be used for connection of light fixtures.

F. Wires used as feeders to switchboards, panelboards, motor control centers, or other major electrical components shall be type XHHW-2.

G. All conductors shall be colored as follows:
   1. 208 Y/120V, 3∅
      a. A Phase Black
      b. B Phase Red
      c. C Phase Blue
      d. Neutral White
      e. Ground Green
   2. 480 Y/277v, 3∅
      a. A Phase Brown

b. B Phase Orange
c. C Phase Yellow
d. Neutral White
e. Ground Green

2.03 CONNECTORS AND SPLICES

A. UL-listed, factory-fabricated wiring connectors of size, ampacity rating, material, type, and class for application and service indicated. Comply with Project's installation requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine raceways and building finishes to receive wires and cables for compliance with requirements for installation tolerances and other conditions affecting performance of wires and cables. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 WIRE AND CABLE INSULATION

A. All wiring shall be installed in accordance with the California Electrical Code. All wiring shall be installed in conduit except where other raceway systems or methods are specifically shown on the drawings or required by the specifications.

B. Thoroughly clean out all wireways and see that all parts are perfectly dry before pulling any wires. Lubricants shall be designed for use with the insulation type used and the temperature conditions. A mechanical wire puller may be used where directed, in which case a lubricant shall be used. Any wire damaged as a result of installation under this section shall be pulled out and replaced with new at no additional cost to OUSD.

C. Make all connections necessary to properly complete the electric wiring. Connections shall be made only in outlet boxes, or in switchboards, or panels having sufficient code-sized gutter space.

D. Connections to equipment or busbars shall be made with approved solderless compression type copper lugs for all wires No. 8 AWG and larger. Special lugs or connections shall be as shown on the plans. Binding screws may be used for size No. 10 and smaller. Where stranded wire is connected to binding screws, nylon, self-insulated, ring tongue, pressure type terminals or equal, no know equal shall be used on the wire. Soldering will not be an acceptable method of connecting any power conductors. Clipping of wires from standard cable to fit connectors and terminal lugs shall not be permitted.

E. All conductors shall be continuous from outlet to outlet and no splices shall be made except within outlet or junction boxes. At least 8" of wire shall be left at outlet boxes for connecting fixtures and devices.

F. No wire smaller than No. 12-gauge shall be used, except for signal or control systems, or where otherwise indicated. No. 10-gauge AWG wire shall be used for 20 ampere 120 volt branch circuits in excess of 100 feet in length. This is intended to reduce branch circuit voltage drop and takes precedence over No. 12 branch circuitry indicated in drawings. Record drawings shall indicate installed wire size.

G. Parallel Feeders:
1. Each phase wire and neutral wire of each parallel run shall be the same length (310-3).

H. Wires entering switchboards, panelboards, transformers, and disconnects shall be of sufficient length for proper termination without splicing within the equipment enclosure. Any wires installed that require splicing for terminating shall be removed and replaced with ones of the proper length. Wires shall be trained and supported in neat bundles.

I. Wiring Bundles or Harnesses:

1. Multiple wires in bundles or harnesses terminating in control panels, switchboards, panelboards, etc., shall be bundled, trained and laced to achieve a neat and workmanlike appearance.
2. Surplus wire protruding from the harness for termination shall be trimmed to proper length. Do not fold and stuff surplus wires into wiring gutters.
3. Wires exiting the bundle or harness shall be carefully trained at a 90° degree angle to the termination point.

J. Permanent tags shall be connected to all feeders in intermediate pullboxes (where used) to provide identification for future use.

K. The maximum number of "hot" (phase conductors) wires for feeder or branch circuit wiring in one (1) conduit shall not exceed three (3) unless otherwise noted. All branch circuits shall have a separate neutral. No common neutrals shall be allowed. Each neutral shall be labeled with circuit number.

L. Cable Terminating: Terminations of insulated power an lighting cables shall be protected from accidental contact, deterioration of coverings, and moisture by the use of terminating devices and materials. Terminations shall be made using materials and methods as indicated or specified herein or as designated by the written instruction of the cable manufacturer and termination kit manufacturer.

3.03 CONNECTIONS

A. Conductor Splices: Avoid splices for new design or renovation.

B. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches (300 mm) of slack.

C. Connect outlets and components to wiring and to ground as indicated and instructed by manufacturer.

D. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.04 FIELD TESTS:

A. As an exception to requirements that may be stated elsewhere in the contract, the Architect shall be given five (5) working days notice prior to each test.

B. Testing Equipment: The testing equipment and devices used in performing the required tests shall have a calibration sticker affixed to the device stating the date when calibrated, date due for re-calibration, and the signature of the individual who did the calibration. In addition to the sticker a certificate shall also contain the brand name and the serial number of the device.

C. Insulation Resistance Test for System 600 Volts and Less: After all wiring is completed and connected ready for operation, but prior to placing system in service and before any branch circuit breakers are closed, insulation resistance tests shall be made in all feeder and subfeeder circuits. The insulation resistance between conductors and between each conductor and ground shall be measured. Measurements shall be made with an instrument capable of marking measurements at an applied potential of 500 volts. Readings shall be taken after the voltage has been applied for a minimum of one minute. The minimum insulation resistance for circuits of No. 12 AWG conductors shall be 1,000,000 ohms. For circuits of No. 10 AWG or larger conductors, a resistance based on the allowable ampacity of the conductor as fixed by NFPA 70 shall be as follows:

1. 25 through 40 amperes 250,000 ohms
2. 51 through 100 amperes 100,000 ohms
3. 101 through 200 amperes 50,000 ohms

4. 201 through 400 amperes 25,000 ohms
5. 401 through 800 amperes 12,000 ohms
6. Over 800 amperes 5,000 ohms

D. Test Report (Submit four (4) copies in writing):

1. 600 volt cables (identify each cable and test results).

END OF SECTION

SECTION 26 05 26

GROUNDING AND BONDING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Section 26 05 10 – General Electrical Requirements.

B. Section 26 05 12 – Basic Materials and Methods.

C. Section – General Telecommunications Requirements.

1.02 SUMMARY

A. This Section specifies the minimum materials and performance standards for grounding and bonding Oceanside Unified School District new construction and remodels.

B. Sections include:
1. Grounding electrodes and conductors.
2. Grounding electrodes.
3. Equipment grounding conductors.
4. Bonding.

1.03 REFERENCES

A. American National Standards Institute (ANSI) Publication C2-97 – National Electrical Safety Code.

B. Electronic Industries Association and Telecommunication Industries Association (EIA/TIA) Publications:
1. EIA/TIA 568A – Commercial Building Telecommunications Wiring Standard.
2. EIA/TIA 569 – Commercial Building Standard for Telecommunications Pathways.
3. EIA/TIA 607 – Grounding and Bonding for Communications.

C. Institute of Electrical and Electronic Engineers (IEEE) Publication 142 – Recommended Practice for Grounding of Industrial and Commercial Power Systems.

D. National Fire Protection Association (NFPA) Publication:
1. 70 – National Electrical Code (NEC).
2. 780 – Lightning Protection Code.

E. Underwriters Laboratories, Inc. (U.L.) Publication:
1. 83 - Thermoplastic Insulated Wires.
2. 467 - Grounding and Bonding Equipment.
3. 486A - Wire Connectors and Soldering Lugs for Use with Copper Conductors.

1.04 REGULATORY REQUIREMENTS

A. The Contractor shall conform to requirements of the National Electrical Code Article 250 and California Electrical Code.

B. The Contractor shall furnish products listed and classified by Underwriters Laboratories, Inc. or testing firm acceptable to the OUSD as suitable for purpose specified and shown.

1.05 PERFORMANCE REQUIREMENTS

A. Grounding system resistance shall be 25 ohms or less unless otherwise indicated.

1.06 SUBMITTALS:

A. The following information shall be submitted for review and approval in accordance with Section 26 05 10, "General Electrical Requirements".
1. Catalog Cut:

a. Ground Rod.
b. Ground Connectors

2. Ground resistance from each major piece of equipment to the ground electrode. Equipment shall include, but not be limited to the following:
   a. Main Switchboard/Switchgear
   b. Distribution Panelboards
3. Thermal (or Exothermic) Weld Process

1.07 WARRANTY

A. Warranty shall comply with the provisions of Section 26 05 10, "General Electrical Requirements".

PART 2 PRODUCTS

2.01 GROUND RODS:

A. Provide copper clad steel with adequate diameter to permit driving it full length of the rod in the earth but not less than ¾-inch. Length shall be 10-feet unless otherwise indicated.

2.02 COLD WATER PIPE OR BUILDING STEEL CONNECTOR:

A. Connector shall be silicon bronze as manufactured by Burndy or equal, not know equal.

2.03 EXOTHERMIC WELDS:

A. Provide exothermic welds which require no outside source of heat or power. Welds shall be accomplished by reduction of copper oxide and aluminum powered metals in a mold. Weld shall provide connection of conductor to device, device to device or conductor to conductor as required. Weld shall be of proper size to provide continuous rating of devices or conductors which are connected.

2.04 GROUNDING AND BONDING CONDUCTORS

A. Grounding and bonding conductors shall be sized in accordance with Table for equipment grounding conductors-NEC.

PART 3 EXECUTION

3.01 INSTALLATION

A. Make mechanical and electrical contact at all panelboards, outlet boxes, junction boxes, and wherever the conduit run is connected. Permanently and effectively ground all conduit and other equipment as required by all applicable codes, regulations and standards.

B. Install a code sized insulated ground wire in all conduits unless a larger size is indicated on plans.

C. System neutrals shall only be grounded at the main service and separately derived systems. The service neutral shall be connected to the nearest effectively grounding building structural steel and metal water pipe, (close to where it enters the building). Neutral conductors of separately derived systems shall be connected to effectively grounded building structural steel or a metal water pipe. Ground rods may be used to ground the system neutral conductor only if building steel and metal water pipes are not available.

D. Drive ground rods full length in a depression at least six (6)-inches below finished grade. When more than one (1) rod is driven, space them at least the full length of the rod.
   1. Provide minimum No. 3/0 AWG bare stranded copper grounding electrode conductor. Run in rigid steel conduit, connect the grounding conductor to one end of the conduit, using proper sized grounding bushing. Provide connection suitable for the full rated current of the conductor.

2. Make all grounding connection which are to be buried or otherwise normally unaccessible thermal welds or by using a mechanical connector and brazing over completely. Thermal welds which have puffed up or shown convex surfaces (indicating improper cleaning at the surfaces) are not acceptable. No mechanical connector is required at the thermal weldments.

E. Provide a "UFER" ground for electrical service, consisting of a minimum of 25 feet of bare stranded copper wire embedded in concrete (feeder encasement footing, floor slab, etc.,) so that all portions of the cable are between 2 inches and 4 inches from the earth and with the center of the cable bonded to the ground rod or pipe.

F. Provide a separate green insulated ground wire in all conduit runs.

G. The green insulated ground wire shall connect directly to the junction box and ground screw.

H. Computer outlet circuits: Install insulated equipment grounding conductor in branch circuit runs from the computer area power panels or power, distribution units.

I. All metallic ramps and freestanding handrails, not attached to permanent building structural steel, shall be permanently and effectively grounded. Provide ground connection to a ground rod installed in accordance with Section 2.2A.

3.02 TESTS:

A. All testing shall be performed by an independent testing agency.

B. As an exception to requirements that may be stated elsewhere in the contract, the Architect shall be given five (5) working days notice prior to each test.

C. The testing equipment and devices used in performing the required tests shall have a calibration sticker affixed to the device stating the date when calibrated, date due for re-calibration, and the signature of the individual who did the calibration. In addition to the sticker, a certificate shall also contain the brand name and the serial number of the device.

D. Ground Rod Test: Test ground rods for ground resistance value before any wire is connected. A portable testing megger shall be used to test each ground or group of grounds. The auxiliary or reference ground rods shall be ¾-inch copper clad steel, not less than 4-feet in length and driven 3-1/2 feet deep, and shall be installed in a straight line from the ground being tested. Number 14 AWG stranded wire leads with at least 600 volt rubber insulation shall be connected to binding post on the instrument.
   1. When there is more than one (1) ground within a circle of 10-feet at a particular location, the reference rods as driven for the "first" test shall be used for tests on the other rods without changing their location. The instrument shall be equipped with a meter reading directly in ohms or fractions thereof to indicate the ground value of the ground electrode under test. Provide one (1) copy of the megger manufacturer's directions for use of the ground megger indicating the methods to be used.

E. Test Report (Submit four (4) copies in writing):
   1. Grounding electrodes and systems (identifying electrodes and systems, each test).

END OF SECTION

SECTION 26 05 33

RACEWAYS AND FITTINGS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. The provisions of Section 26 05 10, "General Electrical Requirements", and Section 16050, "Basic Electrical Materials and Methods".

1.02 SUMMARY

B. The following information shall be submitted for review and approval in accordance with Section 26 05 10, "General Electrical Requirements".

C. Surface Raceways and Fittings.

D. Conduits and tubing for conductors shall be delivered to the site in standard lengths with each length bearing the manufacturer's trademark or stamp and U.L. labeled.

E. Warning Tape: The Contractor shall submit a ten (10) foot sample of the warning tape. The sample will be retained for comparison with the installed tape.

F. Pullrope: The Contractor shall submit a twenty-five (25) foot sample of the pull rope. The sample will be retained for comparison with the installed pullrope.

G. Field Test Reports:
   1. Provide field test report for compaction tests.

1.03 REFERENCES:

H. National Electrical Manufacturer's Association (NEMA) Publications.

I. American Society for Testing and Materials (ASTM) Publications.

J. American Association of State Highway and Transportation Officials (AASHTO).

K. National Fire Protection Association (NFPA) Publications.

L. State of California Public Utilities Commission (Cal P.U.C.) Publications.

M. Underwriters Laboratories, Inc., (UL) Publications.

1.04 WARRANTY

N. Warranty shall comply with the provisions of Section 26 05 10, "General Electrical Requirements".

PART 2 PRODUCTS

2.01 CONDUITS AND FITTINGS:

A. Standard weight rigid galvanized steel (RGS) conduit shall be hot dipped galvanized or sherardized. Rigid conduit shall be used with threaded fittings only. Couplings, locknuts, bushings, etc., shall be hot dipped galvanized or sherardized. Where indicated, rigid steel conduit shall be PVC coated (minimum 40 mils).

P. Electrical metallic tubing (EMT) shall be galvanized or sherardized. Fittings for Electrical Metallic Tubing shall be steel, Duro, Thomas & Betts or equal as approved, shall be "driven-on" (push-on), or wrench tightened compression type, which shall provide pull-on force resistance and electrical continuity as required by UL 514, Drive-on fittings shall contain grips which engage the conduit as the fittings are forced on. Fittings shall have plastic-insulated throats. Indentor or set screw shall not be used.

Q. Flexible conduit shall be galvanized steel. Where used in damp or wet locations or where indicated herein, it shall be of the liquid-tight type with outer neoprene jacket and suitable liquid-tight fittings.

R. Rigid non-metallic conduit shall be (PVC) Schedule 40, U.L. approved. All couplings, fittings, solvent cement, etc., shall be manufactured specifically for the type of material with which they are used. Plastic conduit shall be stored on a flat surface and protected from direct sunlight.

S. Conduit and fittings for hazardous locations (Class I, Groups A, B, C, and D and Class II, Groups E, F, and G) shall be in accordance with U.L. 886.

2.02 WARNING TAPE:

A. Warning tape shall be 5.5 mil composition film, 6-inches wide containing one layer of metalized foil laminated between two (2) layers of inert plastic film specifically formulated for prolonged use underground. Tape shall be highly resistant to alkalis, acids and other destructive agents found in the soil. Warning tape shall bear a continuous printed message warning of the exact location of underground installations. This message shall be in permanent ink specifically formulated for prolonged use underground. Tape shall have black letter (minimum ½ inch high) on red background with the message "ELECTRICAL" printed on twelve (12)-inch centers for the entire length of the tape.

2.03 PULLROPE:

A. The pull shall be polyethylene with a minimum tensile strength of 200-pounds.

PART 3 EXECUTION

3.01 LOCATIONS:

A. Rigid Galvanized Conduit (RGS):
1. Where exposed to weather (including rooftop and under canopy locations).
2. For roof penetrations.
3. Underground in contact with earth.
4. Underground below concrete slab.
5. In concrete or masonry construction.
6. For all or any portion of exposed conduits less than five (5)-feet above finished floor.
7. To concealed locations from below grade PVC coated RGS risers up to the first device or to five (5)-feet above finished floor.
8. Hazardous locations.
9. Where shown on drawings or indicated herein.

B. RGS With PVC Coating:
1. Conduit stub-ups from underground including the final 90 degrees sweep and the riser.
2. Underground bends or sweeps in PVC conduit.
3. Where shown on drawings.

C. Electrical Metallic tubing (EMT):
1. Interior dry locations.
2. Above five (5)-feet in interior exposed locations.
3. Above five (5)-feet or above the first device in interior concealed locations for conduit risers from below the bottom floor slab.
4. EMT shall <u>not</u> be installed on rooftop or under canopy locations or in poured concrete or masonry construction. EMT shall not be used for roof penetrations.

D. Flexible Metal Conduit:
1. Final device connections to direct wired, vibrating, equipment, i.e. motors, transformers, etc., length not to exceed three (3)-feet long in interior dry locations .
2. Light fixture connections in accessible locations (6 feet maximum).

E. Liquid-tight Flexible Metal Conduit:

1. Final connections of conduit systems to all motors, generators and direct wired vibrating equipment (including transformers) for interior and exterior locations not to exceed three (3)-feet long.
2. At seismic separations or building expansion joint.

F. Rigid Non-metallic Conduit (PVC):
1. Rigid non-metallic conduit (PVC-40) may be installed in place of RGS underground, outside of the building foundation.
2. Rigid non-metallic conduit, (PVC-40) may be installed in place of RGS underground, under the building bottom floor slab, encased in 3 inches of sand must be installed a minimum of 8 inches clear to bottom of slab.
3. Concrete walls or slabs except bottom floor.
4. Where shown on drawings.

3.02 CONDUIT SIZES:

A. The minimum conduit size shall be ¾-inch for lighting and power branch circuit wiring. The minimum "Homerun" conduit size to any panepoundsoard, load center, switchboard, or motor control center shall be ¾-inch. For concrete encased duct structures the minimum size shall be 4 inches unless otherwise noted.

B. The maximum EMT size shall be 4 inches.

C. Condulets for conduits larger than 1-½ inch I.D. shall be of the mogul design secured to the building structure within 6 inches each of conduit connection.

3.03 INSTALLATION

A. All conduits shall contain an insulated ground wire whether indicated or not. The ground wire shall be sized in accordance with Table 250-122 of the Code, unless otherwise noted.

B. All conduit systems shall be mechanically and electrically continuous.

C. Conduits shall not be encased in concrete floor slabs on grade (bottom floor slab).

D. No conduit for any purpose shall be installed in or under any portion of the concrete floor slab of vault spaces.

E. Conduit shall not run through footings or grade beams or other structural members except where specifically directed by the Architect.

F. All conduit to be installed in concrete or masonry work shall be carefully laid and rigidly supported in the forms in such a manner as to provide proper clearance and so that all boxes and rings will be flush after concrete has set and forms have been removed. Conduit installation shall not, in any case, weaken the structural integrity of the concrete wall or slab. Additional rebar required to maintain the structural strength of the concrete shall be the responsibility of the Electrical Contractor.

B. Pain underground rigid steel conduit with "Phelans" asphltum, or approved equal.

C. Seal service entrance conduits and all underground conduit runs with "Duct Seal" or equal. Make gas-tight. This includes PVC conduit runs which terminate in steel risers. Seal in junction boxes, panepoundsoards, and /or switchboards.

D. Conduits shall be run concealed, except in certain approved and indicated locations. Conduits shall be grouped in neat parallel lines following the lines of the building structure.

E. Rooftop conduits (rigid steel) shall be neatly grouped and installed parallel to the building lines. Support conduits on minimum 4 inches x 6 inches redwood sleepers at minimum 5 feet spacing.

F. Conduit only (C.O.) routed for device connections into accessible corridor ceiling locations shall be securely fastened to the structure to prevent movement during wire or cable pulling.

G. A polyethylene pullrope shall be installed in every run of "conduit only" (C.O.). A minimum of 36-inches of slack shall be left at both ends of each pullrope. Both ends of all pullropes shall be identified by means of labels or tags which shall identify the location or room designation of the other end.

H. The ends of all conduit shall be square, carefully reamed out to full size, shouldered in the fittings, and bushed or capped wherever stubbed clear of the building.

G. Upon completion of any run of conduit, test the run and see that it is free of obstruction. Plug each end with conduit pennies and bushings and leave plugged until ready to pull wire or cable.

I. Not more than four (4) 90 degrees ells or bends or the equivalent shall be used in any single run of conduit. Conduits for telephone, television or data cable shall not have more than two (2) 90-degrees bends or the equivalent. Where more bends are necessary, provide suitable code size pulpoundsoxes or fittings. All conduits for telephone, television or data systems cable shall have large radius bends. Pulpoundsoxes shall be installed in accessible locations.

J. Conduit installed on equipment shall not obstruct any removable panel, access door, or control. Control apparatus, outlet, junction, and pulpoundsoxes, shall be installed so as not to interfere with any piping, fixtures, or equipment.

K. Provide one (1) ¾-inch conduit (minimum of six (6) total) for each three (3) spares or spaces in all flush mounted power of lighting panepoundsoards. Route conduits to accessible space above ceiling; cap and tag conduit

L. Conduits installed across seismic separations (expansion joints) shall include, but not limited to, the following:.
   1. The conduit (rigid steel or EMT) shall be securely anchored on each side of the seismic separation with a pipe hanger per SMACNA details.
   2. The spacing between conduit ends shall be 36 inches minimum.
   3. A liquid-tight flexible metal conduit of the same size shall be installed between the conduit ends spanning the seismic separation.
   4. The liquid-tight flexible metal conduit shall be of sufficient length to provide for a longitudinal and axial deflection of two (2)-inches minimum in all directions.

M. Fire alarm conduit shall be painted red 6 inches wide for each eight (8)-feet of length or part thereof.

N. All signal system conduits shall be uniquely color coded in the same manner as the fire alarm conduit. Each system shall have a different color.

O. Openings for conduits passing through fire rated floors, walls or ceilings shall b sealed in accordance with Section 16050, "Basic Electrical Materials and Methods".

P. All exposed conduits shall be primed and painted to match the surround finishes. Final color choice shall be selected by the Architect.

Q. Separate conduits shall be provided for the installation of normal and emergency power system wiring and for separating the branches of the emergency power system wiring.

3.05 GROUNDING:

A. Grounding shall be accordance with Section 26 05 26, "Grounding and Bonding".

3.06 CONDUIT SUPPORTS:

A. Conduit, which is not buried or embedded in concrete, shall be supported by straps, clamps or hangers to provide a rigid installation.

B. Conduit shall not be installed on hangers and/or supported installed by other trades for their use.

C. Conduit shall not be supported from or attached to ceiling wire and/or ceiling suspension systems or other systems installed for purposes of accommodating other systems within the building.

D. Conduit shall not be supported from other conduit.

E. Conduits shall be supported within three (3) feet of any kind of fitting and at every outlet or junction box, panel, etc. This shall apply to both horizontal and vertical runs.

F. Powder-driven pins or studs shall not be used.

G. Where conduits are run individually, they shall be supported by approved straps, clamps, and hangers.

1. No perforated straps or wire hanger of any kind shall be used.

H. Conduits installed exposed in damp locations shall be provided with clamp back under each conduit clamp to prevent accumulation of moisture around the conduits.

1. Open bottom, spring tension, snap-in clamps shall not be used.

I. Where a number of conduits are to be run parallel, they shall be grouped and supported by trapeze hanger. Each conduit shall be clamped to the trapeze hanger with conduit clamps.

J. All concrete inserts and pip straps shall be galvanized.
1. Multiple conduits shall be coordinated as to their location on the rack so that they enter and exit the rack in an orderly fashion with as little crossing of conduits as possible.
2. Trapeze hanger shall be constructed to allow for future growth. Provide a minimum 20 percent empty space on each rack for future conduit runs.

K. All steel bolts, nuts, washer, rods, trapeze hangers and screws shall be galvanized or cadmium-plated.

L. Support horizontal runs of RGS or EMT at a maximum of eight (8) feet between supports.

M. Support vertical runs of RGS or EMT at a maximum of ten (10) feet between supports.

N. Support RGS or EMT within three (3) feet outlet boxes, junction boxes, cabinets or fittings. Support flexible conduit within one (1) foot of boxes.

3.07 SEISMIC BRACING:

A. Use the following criteria for seismic bracing of electrical conduits:
1. Wherever combined weights of multiple conduits plus contents on a trapeze equal or exceeds the weight of a single 2-1/2-inch conduit plus contents, brace trapeze system in accord with SMACNA Guideline Details 26 and 37.

B. The following conduit plus contents weight data may be used for EMT in lieu of page 9 of SMACNA guidelines:

CONDUIT PLUS CONTENTS WEIGHT DATA

EMT SIZE (IN)	POUNDS/FT
¾	0.88
1	1.30
1-1/4	1.90
1-1/2	2.70

	2		4.40
	2-1/2		5.70
1		9.40	
	3-1/2		10.00
2		12.50	

C. SMAC guidelines for bracing Schedule 34 is set up in maximum weight per trapeze support assembly. Weight per trapeze support assembly must be calculated from above table and spacing between support assemblies.

D. For assemblies carrying less than 320-pounds, down to equivalent of a single 2-½-inch conduit plus contents, sue 320-pounds criteria.

END OF SECTION

SECTION 26 05 34

OUTLET, PULL AND JUNCTION BOXES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. The provisions of Section 26 05 10, "General Electrical Requirements", and Section 26 05 12, "Basic Electrical Materials and Methods".

1.2 REFERENCES

A. National Electrical Manufacturers Association.

B. American Society for Testing and Materials.

C. National Electrical Code
   1. Division 2 Section "Underground Ducts and Utility Structures" for exterior ductbanks, manholes, and underground utility construction.
   2. Division 7 Section "Through-Penetration Firestop Systems" for firestopping materials and installation at penetrations through walls, ceilings, and other fire-rated elements.
   3. Division 26 Section "Basic Electrical Materials and Methods" for supports, anchors, and identification products.

1.3 SUMMARY

A. Outlet Boxes.

B. Pull Boxes.

C. Junction Boxes.

1.4 WARRANTY:

A. Warranty shall comply with the provisions of Section 16010, "General Electrical Requirements".

PART 2 PRODUCTS

2.01 MANUFACTURERS

B. The size of each outlet or junction box shall be determined by the number and sizes of wires and conduits entering the box, but shall be not less than 4-inch square and 2-1/8-inches deep unless otherwise indicated.

A. Outlet and junction boxes for interior use shall be galvanized or sherardized, one-piece pressed or welded steel, knockout type, except where other types of boxes are indicated or specified.

B. Outlet and junction boxes for exterior use shall be lug type "Bell" boxes "250L" through "254L", "Crouse-Hinds FS" type, as applicable or equal.

C. Outlet boxes shall be equipped with plaster rings, inserts and fixture studs as may be required. Knockout seals shall be provided where knockouts are not intact.

D. Plastic, fiber or composition boxes shall <u>not</u> be permitted.

E. Telecommunication Outlets: Voice and data wall outlet boxes shall be 4-11/16-inch square by 2-1/8-inch deep metal boxes, with plaster ring.

F. Outlet boxes for hazardous locations (Class I, Groups A, B, C, and D; and Class II, groups D, F and G) shall be in accordance with U.L. 886.

G. All exterior pull boxes, plates, fittings, etc., mounted below 10 feet – 0 inch in height shall be fitted with rustproof, tamperproof screws. Provide Owner with two (2) screw drivers (or wrenches) to fit special screws. Screws shall be Spanner, Key Slot, or Rosette.

H. Boxes in concrete shall be of the type to allow placing of conduit without displacing reinforcing bars, and shall be type approved for concrete use. Boxes installed in poured concrete shall be packed with approved material to prevent concrete entering box. Do not use paper for such packing.

PART 3 EXECUTION

3.01 INSTALLATION

A. Outlet boxes shall be securely and independently fastened to the structure and in concealed work shall be supported flush with finished surface of walls or ceiling.

B. Bar hangers fitted with fixture studs shall be used to support and outlet boxes in stud partitions and in furred or plastered ceilings.

C. Fasteners shall be machine screws, nut and lock washers in metal, wood screws, in wood, or expansion shields or inserts in masonry or concrete. Wooden inserts will not be acceptable.

D. Label outside of box to identify panel and circuit numbers. Use indelible markers, non-erasing type, for boxes above ceilings or in concealed locations.

E. Fire alarm boxes shall be painted red.

END OF SECTION

SECTION 26 05 53

ELECTRICAL IDENTIFICATION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections.

B. Section 26 05 19 – Building wires and cables.

C. Section 26 05 12 – Basic electrical material and methods.

1.02 SUMMARY

A. Nameplate and labels.

B. Wire and cable markers.

C. Conduit markers.

D. Underground warning tape.

E. Warning signs.

1.03 REFERENCES

A. Comply with ANSI C2 National Electrical Safety Code.

B. Comply with NFPA 70.

C. Comply with ANSI A13.1 and NFPA 70 for color-coding.

D. Z35 Safety Color Code.

E. California Code of Regulations (CCR), Title 8, Title 24.

1.04 REGULATORY REQUIREMENTS

A. This Section includes electrical identification materials and devices required to comply with ANSI C2, NFPA 70, OSHA standards and SDUSD standards.

PART 2 PRODUCTS

2.01 NAMEPLATES

A. Nameplate designations shall clearly state:
   1. Manufacturer's nameplate including equipment design rating of current, voltage, kVA, HP, bus bracing rating, or as applicable.
   2. Equipment nameplate designating system usage and purpose, system nominal voltage, equipment rating for kVA, amperes, HP and RPM as applicable.
   3. Contactors: Voltage, continuous current, horsepower or interrupting current, and whether "mechanically-held" or "electrically-held".
   4. Motors: Rated voltage, full load amperes, frequency, phases, speed, horsepower, code letter rating, time rating, type of winding, class and temperature.
   5. Controllers: Voltage, current, horsepower, and trip setting of motor running overcurrent protection.
   6. Receptacles and lighting switches (wiring devices): Panel designation and circuit number.

B. Surface shall be matte finish. Corners shall be square. Lettering shall be accurately aligned in the black core. Minimum size of nameplates shall be 1.0 inch by 3 inches, except that wiring

device nameplates shall be 0.5 inch by 1.5 inch. Lettering shall be normal block style unless otherwise noted.

C. Letter Size:
   1. Use 0.25 inch letters for identifying individual equipment and loads.
   2. Use 0.50 inch for identifying grouped equipment and loads.

D. Baked-Enamel Signs for Interior Use: Pre-printed aluminum, punched or drilled for fasteners, with colors, legend and size required for the application. ¼-inch (6.4mm) grommets in corners for mounting.

E. Exterior, Metal-Backed, Butyrate Signs: Weather-resistance, non-fading, pre-printed, cellulose-acetate butyrate signs with 0.0396-inch (1-mm) galvanized-steel backing; and with colors, legend, and size required for the application. ¼-inch (6.4mm) grommets in corners for mounting.

F. Fasteners for Nameplates and Signs: Self-tapping, stainless-steel screws or No. 10/32, stainless-steel machine screws with nuts and flat and lock washers.

2.02 WIRE AND CABLE MARKERS

A. Description: Heat shrinkable, flame-retarded, crosslinked polyolefin wire marker. Wire tags shall have a dielectric strength of 500 V/mil minimum and a temperature range from - 30 degrees C to 105 degrees C. Thermoplastic or wraparound tags shall not be used. All tags shall be printed using a 9 or 24 pin dot mastic printer. Manufacturer: Raychem ShrinkMark, Brady Permasleeve or approved equal.

B. Legend:
   1. Power and Lighting Circuits: Branch circuit or feeder number indicated on drawings.
   2. Color: Black letters on orange field.
   3. Control Circuits: Control wire number indicated on schematic or interconnection diagrams on shop drawings.

2.03 CONDUIT MARKERS

A. ANSI Z35.

B. Pressure-sensitive, adhesive-backed vinyl markers with fade-proof ultraviolet inhibitors, black characters on orange background.

C. 2.25 inches x 9 inches markers with 1.5 inch high letters.

D. Manufacturer: Carlton Industries type EM-1, Seton Code Electrical style AA or approved equal.

2.04 UNDERGROUND WARNING TAPE

A. The tape shall be 6 inches wide x 0.004 inch polyethylene plastic with a metallic core detection tape.

B. The tape shall be a bright color contrast with soil, with identifying printing on one side.

C. The imprint shall read "Caution (type of utility) Line Buried Below".

D. The identifying lettering shall be repeated continuously the full length of the tape.

E. Manufacturer: Seton style 6ELE, THOR Enterprises or approved equal.

2.05 WARNING SIGNS

A. ANSI Z35.

2.06 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Cable Ties: Fungus-inert, self-extinguishing, one-piece, self-locking, Type 6/6 nylon cable ties.
   1. Minimum Width: 3/16 inch (5 mm).

2. Tensile Strength: 50 pounds (22.3 kg) minimum.
3. Temperature Range: Minus 40 to plus 185 degrees F (Minus 40 to plus 85 degrees C).
4. Color: According to color-coding.

B. Paint: Formulated for the type of surface and intended use.
1. Primer for Galvanized Metal: Single-component acrylic vehicle formulated for galvanized surfaces.
2. Primer for Concrete Masonry Units: Heavy-duty-resin block filler.
3. Primer for Concrete: Clear, alkali-resistant, binder-type sealer.
4. Enamel: Silicone-alkyd or alkyd urethane as recommended by primer manufacturer.

PART 3 EXECUTION

3.01 INSTALLATION

A. Identification Materials and Devices: Install at locations for most convenient viewing without interference with operation and maintenance of equipment.

B. Lettering, Colors, and Graphics: Coordinate names, abbreviations, colors, and other designations with corresponding designations in the Contract Documents or with those required by codes and standards. Use consistent designations throughout Project.

C. Sequence of Work: If identification is applied to surfaces that require finish, install identification after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before applying.

E. Install painted identification according to manufacturer's written instructions and as follows:
1. Clean surfaces of dust, loose material, and oily films before painting.
2. Prime surfaces using type of primer specified for surface.
3. Apply one intermediate and one finish coat of enamel.

F. Raceways/Conduits Identification Labels.
1. All signal systems and lighting systems shall be identified with weather-resistant, fade-resistant labels identifying the system. Each system shall be color-coded as described below.
2. Labels shall be placed by Electrical Contractor or equal on every conduit run, within 2' of every junction box or connector, and each 6' thereafter (2 labels per every 10' of conduit). Labels shall wrap around conduit and placed for maximum visibility.
3. All junction boxes not otherwise identified shall have a systems label on the cover.
4. A laminated schedule shall be posted in each electrical, mechanical, and signal room, showing each label and the system it identifies.
5. Label Colors

System Type	Identification	Background	Lettering
Lighting & Power	Standard Voltage	Orange	White
Cable Television	CATV	Brown	White
Clock	CLOCK	Black	White
Data	DATA	Violet	White
Emergency Circuits	EMERG	Yellow	Black
Energy Management System	EMS	White	Black
Fiber Optic System	FIBER	Pink	Black

Fire Alarm	FIRE	Red	White
Independent Public Address	IPA	Gray	White
Security/Intrusion	SECUR	Green	White
Telecommunications	TELECOM	Blue	White

6. Label Sizes

System Type	Size	Background	Lettering
Lighting & Power	2" (w) x3" (h)	Orange	3/8" White
Cable TV System	2" (w) x3" (h)	Brown	3/8" White
Clock System	2" (w) x3" (h)	Black	3/8" White
Data System	2" (w) x3" (h)	Violet	3/8" White
Emergency Circuits	2" (w) x3" (h)	Yellow	3/8" Black
Energy Management System	2" (w) x3" (h)	White	3/8" Black
Fiber Optic System	2" (w) x3" (h)	Pink	3/8" Black
Fire Alarm System	2" (w) x3" (h)	Red	3/8" White
Independent Public Address System	2" (w) x3" (h)	Gray	3/8" White
Security/Intrusion System	2" (w) x3" (h)	Green	3/8" White
Telecommunication System	2" (w) x3" (h)	Blue	3/8" White

G. Caution Labels for Indoor Boxes and Enclosures for Power and Lighting: Install pressure-sensitive, self-adhesive labels identifying system voltage with black letters on orange background. Install on exterior of door or cover.

H. Circuit Identification Labels on Boxes: Install labels externally.
1. Exposed Boxes: Pressure-sensitive, self-adhesive plastic label on cover.
2. Concealed Boxes: Plasticized card-stock tags.
3. Labeling Legend: Permanent, waterproof listing of panel and circuit number or equivalent.

I. Paths of Underground Electrical Lines: During trench backfilling, for exterior underground power, control, signal, and communication lines, install continuous underground plastic line marker located directly above line at 6 to 8 inches (150 to 200 mm) below finished grade. Where width of multiple lines installed in a common trench or concrete envelope does not exceed 16 inches (400 mm) overall, use a single line marker.

J. Color-Coding of Secondary Phase Conductors: Use the following colors for:
1. 208/120-V Conductors:
    a. Phase A: Black.
    b. Phase B: Red.
    c. Phase C: Blue.
2. 480/277-V Conductors:
    a. Phase A: Brown.
    b. Phase B: Orange.
    c. Phase C: Yellow.

3. Factory apply color the entire length of conductors, except the following field-applied, color-coding methods may be used instead of factory-coded wire for sizes larger than No. 10 AWG:

    a. Colored, pressure-sensitive plastic tape in half-lapped turns for a distance of 6 inches (150 mm) from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Use 1-inch- (25-mm-) wide tape in colors specified. Adjust tape bands to avoid obscuring cable identification markings.

    b. Colored cable ties applied in groups of three ties of specified color to each wire at each terminal or splice point starting 3 inches (76 mm) from the terminal and spaced 3 inches (76 mm) apart. Apply with a special tool or pliers, tighten to a snug fit, and cut off excess length.

K. Power-Circuit Identification: Metal tags or aluminum, wraparound marker bands for cables, feeders, and power circuits in vaults, pull and junction boxes, manholes, and switchboard rooms.
1. Legend: 1/4-inch- (6.4-mm-) steel letter and number stamping or embossing with legend corresponding to indicated circuit designations.
2. Tag Fasteners: Nylon cable ties.
3. Band Fasteners: Integral ears.

L. Apply identification to conductors as follows:
1. Conductors to Be Extended in the Future: Indicate source and circuit numbers.
2. Multiple Power or Lighting Circuits in the Same Enclosure: Identify each conductor with source, voltage, circuit number, and phase. Use color-coding to identify circuits' voltage and phase.
3. Multiple Control and Communication Circuits in the Same Enclosure: Identify each conductor by its system and circuit designation. Use a consistent system of tags, color-coding, or cable marking tape.

M. Apply warning, caution, and instruction signs as follows:
1. Warnings, Cautions, and Instructions: Install to ensure safe operation and maintenance of electrical systems and of items to which they connect. Install engraved plastic-laminated instruction signs with approved legend where instructions are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.
2. Emergency Operation: Install engraved laminated signs with white legend on red background with minimum 3/8-inch- (9-mm-) high lettering for emergency instructions on power transfer, load shedding, and other emergency operations.

N. Equipment Identification Labels: Engraved plastic laminate. Install on each unit of equipment, including central or master unit of each system. This includes power, lighting, communication, signal, and alarm systems, unless units are specified with their own self-explanatory identification. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high lettering on 1-1/2-inch- (38-mm-) high label; where two lines of text are required, use labels 2 inches (50 mm) high. Use white lettering on black field. Apply labels for each unit of the following categories of equipment using mechanical fasteners:
1. Panelboards, electrical cabinets, and enclosures.
2. Access doors and panels for concealed electrical items.
3. Electrical switchgear and switchboards.
4. Electrical substations.
5. Emergency system boxes and enclosures.
6. Motor-control centers.
7. Disconnect switches.
8. Enclosed circuit breakers.
9. Motor starters.

10. Push-button stations.
11. Power transfer equipment.
12. Contactors.
13. Remote-controlled switches.
14. Dimmers.
15. Control devices.
16. Transformers.
17. Inverters.
18. Rectifiers.
19. Frequency converters.
20. Battery racks.
21. Power-generating units.
22. Telephone switching equipment.
23. Clock/program master equipment.
24. Call system master station.
25. TV/audio-monitoring master station.
26. Fire alarm master station or control panel.
27. Security-monitoring master station or control panel.

END OF SECTION

SECTION 26 05 73

OVERCURRENT PROTECTIVE DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The provisions of Section 26 05 10," General Electrical Requirements", Section 26 05 12, "Basic Electrical Materials and Methods", Section 16215, "Power Monitoring and Controls", Section 26 27 26, "Wiring Devices", and Section 16289, "Transient Voltage Suppression".

1.2 REFERENCES

A. National Electrical Manufacturer Association FU 1.

B. National Electrical Code.

1.3 SUMMARY

A. Circuit breakers (each type and style).

B. Circuit breaker handle padlock assembly.

C. Fuses (each type and style).

D. Disconnect switches (each type and size).

E. Enclosures (each type and style).

1.4 WARRANTY

A. Warranty shall comply with the provisions of Section 26 05 10, "General Electrical Requirements".

PART 2 - PRODUCTS

2.1 CIRCUIT BREAKERS

A. Circuit breakers for panelboards, distribution panelboards, distribution switchboards, and main service equipment shall be the manufactured product of the same manufacturer as the equipment in which the circuit breaker is installed.

B. Circuit breakers for panelboards and distribution panelboards shall be bolt-on type. Handle ties and dual, quad or tandem breakers are not acceptable. Mounting hardware, accessories, faceplates, enclosures, etc., shall be provided as required. Each and every circuit breaker shall be provided with a handle padlock attachment. This attachment shall allow the circuit breaker to be padlocked in either the "ON" or "OFF" position. Circuit breakers for distribution switchboards and main service equipment shall be as specified in Section 24 26 16, "Panelboards".

C. Circuit breakers shall be quick-break on manual and automatic operation, and the handle mechanism shall be trip-free to prevent holding contact closed against a short circuit or sustained overload. Contacts shall be of high pressure butt-type and shall be made of a silver alloy material. Arc chutes shall be provided. Automatic thermal and magnetic tripping devices shall be located in each pole for the breaker. The thermal device shall provide time delay tripping on overloads and the magnetic device shall provide instantaneous tripping on short circuits. Circuit breakers with frame sizes above 100 amperes shall have an

instantaneous-magnetic trip adjustment of ten times the circuit breaker's continuous amp rating (unless otherwise indicated). These adjustments shall be accessible from the front of the breaker.

D. Circuit breakers used for switching lighting loads directly shall be approved Type "SW".

E. Circuit breakers used to control motor loads directly shall be approved Type "HACR".

F. Short circuit interrupting capacity shall be as indicated on the plans and shall in no case be less than 10,000 amps symmetrical at 208/120 volt.

G. Circuit breakers provided for installation in existing switchboards or panelboards shall be of the same manufacturer as the existing switchboards or panelboards. The minimum A.I.C. shall not be less than that of the lowest rated device in the existing switchboard or panelboard.

2.2 **FUSES:**

A. Fuse identification labels, showing size and type installed, shall be placed inside the cover of each switch or fused circuit breaker.

B. All fuses shall be of one (1) manufacturer unless otherwise noted to ensure selective operation of protective devices.

C. Fuses shall be as manufactured by Bussmann, Gould-Shawmut, or Brush unless otherwise indicated.

D. Fuses shall be of the following type:

1. Fuses 601 A through 6000 A serving all type of loads shall be U.L. Class L, type KRP-C.

2. Fuses installed in safety switches at motor locations shall be 600 V, FRS or 250V, FRN.

3. Fuses 1/10 A through 600 A shall be U.L. Class RK1; 600V, LPS-RK; 250V, LPN-RK, unless otherwise noted.

E. Spare fuses shall be provided in the amount of 20 percent of each size and type installed, but in no case shall be less than three (3) of each specified size and type supplied. These spares shall be neatly enclosed in a suitable cabinet or cabinets.

2.3 **DISCONNECT SWITCHES:**

A. The disconnect switches shall be heavy duty 600 volt type, externally operated, quick-made, quick-break knife switches, fused or non-fused as required. The number of poles and ampere rating shall be as shown on plans. Fused switches shall have Class "R" rejection features. All switches shall have a U.L. listed short circuit withstand rating. Switches in interior dry location shall be NEMA 1 enclosures. Switches in damp or exterior locations shall have NEMA 3R raintight enclosures. Switches shall be horsepower rated, unless otherwise specified.

B. If double lugging or oversized wires are required, provide a wireway or splice box.

C. Provide fuses as specified in this section. Fuses shall be installed so that the rating is clearly visible without removing fuse.

D. Provide a nameplate on each switch as specified in Section 26 05 12, "Basic Electrical Materials and Methods". Nameplate shall indicate load served, source and circuit number.

E. Submit data on switches with drawings of the main switchboard, distribution switchboards or distribution panelboards, where switches are an assembled part.

PART 3 - **EXECUTION**

3.1 **INSTALLATION**

A. Bolted connections shall be torque-tightened to manufacturer's specifications.

B. Clipping of wires from standard cable to fit connector shall not be permitted. Appropriate connecting device shall be provided for multiple cable connections.

C. Install disconnect switches in locations shown on plans. Test switches a minimum of three (3) times to ensure correct operation.

3.2 **TESTS:**

A. Each and every circuit breaker shall be tested under load a minimum of three (3) times.

END OF SECTION 26 05 73 OVERCURRENT PROTECTIVE DEVICES

SECTION 26 09 23

LIGHTING CONTROL DEVICES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes photoelectric relays, occupancy sensors, and multiple lighting relays and contactors.

B. Related Sections include the following:

1. Division 26 Section 26 09 23 – "Lighting Controls" for low-voltage, manual and programmable lighting control systems.

2. Division 26 Section 26 27 26 – "Wiring Devices" for wall-box dimmers and manual light switches.

1.3 SUBMITTALS

A. Product Data: Include dimensions and data on features, components, and ratings for lighting control devices.

B. Samples: Occupancy sensors, one of each type.

C. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

D. Maintenance Data: For lighting control devices to include in maintenance manuals specified in Division 1– Operation and Maintenance Data.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain lighting control devices from a single source with total responsibility for compatibility of lighting control system components specified in this Section.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, for their indicated use and installation conditions by a testing agency acceptable to authorities having jurisdiction.

C. Comply with 47 CFR 15, Subparts A and B, for Class A digital devices.

D. Comply with NFPA 70.

1.5 COORDINATION

A. Coordinate features of devices specified in this Section with systems and components specified in other Sections to form an integrated system of compatible components. Match components and interconnections for optimum performance of specified functions.

PART 2 PRODUCTS

1.6 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Contactors and Relays:
   a. Watt Stopper, Inc. (The).
   b. Cutler-Hammer Products; Eaton Corporation.
   c. GE Lighting Controls.
   d. Hubbell Lighting, Inc.
   e. Siemens Energy and Automation, Inc.
   f. Square D Co.; Power Management Organization.
2. Photoelectric Relays:
   a. Watt Stopper, Inc. (The).
   b. Intermatic, Inc.
   c. Paragon Electric Co., Inc.
   d. SSAC, Inc.
   e. Tork, Inc.
3. Occupancy Sensors:
   a. Watt Stopper, Inc. (The).
   b. Novitas, Inc.
   c. Mytech Corp.

1.7 GENERAL LIGHTING CONTROL DEVICE REQUIREMENTS

A. Line-Voltage Surge Protection: Include in all 120- and 277-V solid-state equipment. Comply with UL 1449 and with ANSI C62.41 for Category A locations.

1.8 PHOTOELECTRIC RELAYS

A. Description: Solid state, with single-pole, double-throw dry contacts rated to operate connected relay or contactor coils or microprocessor input, and complying with UL 773A.

B. Light-Level Monitoring Range: 0 to 3500 fc, with an adjustment for turn-on/turn-off levels.

C. Time Delay: Prevents false operation.

D. Outdoor Sealed Units: Weathertight housing, resistant to high temperatures and equipped with sun-glare shield.

1.9 OCCUPANCY SENSORS

A. Ceiling-Mounting or Wall Mounted Units: Unit receives control power from a separately mounted auxiliary power and control unit, and operates power switching contacts in that unit.

B. Ceiling-Mounting Units for use with programmable, microprocessor-based systems: Unit receives 24-V dc power from a remote source and, on sensing occupancy, closes contacts that provide signal input the lighting control system.

C. Switch-Box-Mounting Units: Unit receives power directly from switch leg of the 120- or 277-V ac circuit it controls and operates integral power switching contacts rated 800 W at 120-V ac, and 1000 W at 277-V ac, minimum.

D. Operation: Turns lights on when room or covered area is occupied and off when unoccupied, unless otherwise indicated.

1. Time Delay for Turning Lights Off: Adjustable over a range from 1 to 15 minutes, minimum.

2. Manual Override Switch for switch-box mounted units: Turns lights off manually regardless of elapsed time delay.

3. Isolated Relay Contact: Operates on detection of occupancy or vacancy, as indicated, to activate an independent function (refer to Section 15940 – Sequences of Operation).

E. Auxiliary Power and Control Units: As follows:

1. Relays rated for a minimum of 20-A normal ballast load or 13-A tungsten filament or high-inrush ballast load.

2. Sensor Power Supply: Rated to supply the number of connected sensors.

F. Passive-Infrared Type: Detects occupancy by a combination of heat and movement in zone of coverage. Each sensor detects occupancy anywhere in an area of 1000 sq. ft. by detecting occurrence of 6-inch minimum movement of any portion of a human body that presents a minimum target of 36 sq. in. to the sensor.

G. Ultrasonic Type: Emits a beam of ultrasonic energy and detects occupancy through use of Doppler's principle in discerning movement in zone of coverage by sensing a change in pattern of reflected ultrasonic energy.

H. Dual-Technology Type: Uses a combination of passive-infrared and ultrasonic detection methods to distinguish between occupied and unoccupied conditions for area covered. Particular technology or combination of technologies that controls each function (on or off) is selectable in the field by selection of jumpers or dip-switches on unit.

1.10 MULTIPOLE CONTACTORS AND RELAYS

A. Description: Electrically operated and mechanically held, and complying with UL 508 and NEMA ICS 2.

1. Current Rating for Switching: UL listing or rating consistent with type of load served, including tungsten filament, inductive, and high-inrush ballast (ballasts with 15 percent or less total harmonic distortion of normal load current).

2. Control Coil Voltage: Match control power source.

PART 3 EXECUTION

1.11 INSTALLATION

A. Install equipment level and plumb and according to manufacturer's written instructions.

B. Mount lighting control devices according to manufacturer's written instructions and requirements in Division 26 Section 26 05 12 – "Basic Electrical Materials and Methods."

C. Mounting heights indicated are to bottom of unit for suspended devices and to center of unit for wall-mounting devices.

1.12 CONTROL WIRING INSTALLATION

A. Install wiring between sensing and control devices according to manufacturer's written instructions and as specified in Section 26 05 19 – "Wires and Cables" for low-voltage connections.

B. Wiring Method: Install all wiring as specified in Division 16 Section 26 05 33 – "Raceways and Fittings."

C. Bundle, train, and support wiring in enclosures.

D. Ground equipment.

E. Connections: Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.

1.13 IDENTIFICATION

A. Identify components and power and control wiring according to Division 16 Section 26 05 53 – "Electrical Identification."

1.14 FIELD QUALITY CONTROL

A. Schedule visual and mechanical inspections and electrical tests with at least seven days advance notice.

B. Inspect control components for defects and physical damage, testing laboratory labeling, and nameplate compliance with the Contract Documents.

C. Check tightness of electrical connections with torque wrench calibrated within previous six months. Use manufacturer's recommended torque values.

D. Verify settings of photoelectric devices with photometer calibrated within previous six months.

E. Electrical Tests: Use particular caution when testing devices containing solid-state components. Perform the following according to manufacturer's written instructions:

1. Continuity tests of circuits.

2. Operational Tests: Set and operate devices to demonstrate their functions and capabilities in a methodical sequence that cues and reproduces actual operating functions.

   a. Include testing of devices under conditions that simulate actual operational conditions. Record control settings, operations, cues, and functional observations.

F. Correct deficiencies, make necessary adjustments, and retest. Verify that specified requirements are met.

G. Test Labeling: After satisfactory completion of tests and inspections, apply a label to tested components indicating test results, date, and responsible agency and representative.

H. Reports: Written reports of tests and observations. Record defective materials and workmanship and unsatisfactory test results. Record repairs and adjustments.

1.15 CLEANING

A. Cleaning: Clean equipment and devices internally and externally using methods and materials recommended by manufacturers, and repair damaged finishes.

1.16 DEMONSTRATION

A. Engage a factory-authorized service representative to train District's maintenance personnel as specified below:

1. Train District's maintenance personnel on troubleshooting, servicing, adjusting, and preventive maintenance. Provide a minimum of three hours training.

2. Training Aid: Use the approved final version of maintenance manuals as a training aid.

3. Schedule training with District, through Architect, with at least seven days advance notice.

1.17 ON-SITE ASSISTANCE

A. Occupancy Adjustments: Within one year of date of Substantial Completion, provide up to three Project site visits, when requested, to adjust light levels, make program changes, and adjust sensors and controls to suit actual conditions.

****END OF SECTION 26 09 23 LIGHTING CONTROL DEVICES****

SECTION 26 24 16

PANELBOARDS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. The provisions of Section 26 05 10, "General Electrical Requirements", and Section 26 05 12, "Basic Electrical Materials and Methods" apply to this Section as if fully repeated herein.

1.2 SUBMITTALS:

A. Shop drawings for all equipment specified in this section shall be submitted for review and approval in accordance with Section 26 05 10, "General Electrical Requirements".

B. The approval of equipment specified I in this section shall be contingent upon the submittal and approval of the equipment layout drawings required by Section 26 05 10, "General Electrical Requirements".

1.3 WARRANTY

A. Warranty shall comply with the provisions of Section 26 05 10, "General Electrical Requirements".

PART 2 PRODUCTS

2.01 MANUFACTURERS:

A. Panelboards shall be factory assembled circuit breaker type wired and tested and shall be the latest standard product of General Electric, Cutler Hammer-Westinghouse, Siemens, or Square D.

2.02 PANELBOARDS:

A. The number of poles, type, voltage, and ampere ratings shall be as indicated on the plans. Bus bars copper and shall be 100 percent tin plated. Provide full size ground bus. Provide a full-sized isolated ground bus where indicated. Provide full size neutral bus except where a non-linear panelboard is required. Non-linear panelboards, where indicated on plans, shall be provided with a 200 percent neutral bus.

B. Neutral wires shall be connected to a common neutral bus with binding screws or lug. Neutral connections shall be evenly distributed over the entire neutral bus. The neutral bus shall be insulated from the cabinet.

C. All bolted connections shall be torque-tightened in conformance with the manufacturer's recommendation.

PART 3 EXECUTION

3.01 SEISMIC RESTRAINTS:

A. Refer to Section 26 05 12, "Basic Materials and Methods".

3.02 TESTING:

A. Test each circuit breaker in accordance with Section 26 05 73, "Overcurrent Protective Devices".

END OF SECTION

SECTION 26 26 42
SWITCHBOARDS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Switchboards.

B. Switchboard accessories.

1.2 RELATED SECTIONS

A. Section 03300 - Cast-in-Place Concrete: Concrete for supporting foundations and pads.

B. Section 16060 - Grounding and Bonding.

C. Section 16210 - Electrical Utility Services.

D. Section 16491 - Fuses.

1.3 REFERENCES

A. ANSI C12.1 - American National Standard Code for Electricity Metering; 2001.

B. ANSI C39.1 - American National Standard Requirements for Electrical Analog Indicating Instruments; 1981 (R1992).

C. IEC 60051-1 - Direct Acting Indicating Analogue Electrical Measuring Instruments and Their Accessories - Part 1: Definitions and General Requirements Common To All Parts; International Electrotechnical Commission; 1997.

D. IEC 60051-2 - Direct Acting Indicating Analogue Electrical Measuring Instruments and Their Accessories - Part 2: Special Requirements for Ammeters and Voltmeters International Electrotechnical Commission; 1984.

E. IEEE C12.1 - American National Standard Code for Electricity Metering; Institute of Electrical and Electronic Engineers; 1988.

F. IEEE C57.13 - IEEE Standard Requirements for Instrument Transformers; Institute of Electrical and Electronic Engineers; 1993 (R 2003).

G. NECA 400 - Recommended Practice for Installing and Maintaining Switchboards; National Electrical Contractors Association; 1998.

H. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum); National Electrical Manufacturers Association; 2001 (R2006).

I. NEMA PB 2 - Deadfront Distribution Switchboards; National Electrical Manufacturers Association; 2006.

J. NEMA PB 2.1 - General Instructions for Proper Handling, Installation, Operation, and Maintenance of Deadfront Distribution Switchboards Rated 600 Volts or Less; National Electrical Manufacturers Association; 2002.

K. NETA STD ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems; International Electrical Testing Association; 2003.

L. NFPA 70 - National Electrical Code; National Fire Protection Association; 2005.

1.4 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide electrical characteristics including voltage, frame size and trip ratings, fault current withstand ratings, and time-current curves of all equipment and

components.

C. Shop Drawings: Indicate front and side views of enclosures with overall dimensions shown; conduit entrance locations and requirements; nameplate legends; size and number of bus bars per phase, neutral, and ground; and switchboard instrument details.

D. Test Reports: Indicate results of factory production tests.

E. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

F. Project Record Documents: Record actual locations of switchboards.

G. Maintenance Data: Include spare parts listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.5 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Products: Listed and classified by testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver in 48 inch (219 mm) maximum width shipping splits, individually wrapped for protection and mounted on shipping skids.

B. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.

C. Handle in accordance with NEMA PB 2.1 and manufacturer's written instructions. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to switchboard internal components, enclosure, and finish.

1.7 MAINTENANCE MATERIALS

A. See Section 01600 - Product Requirements, for additional provisions.

B. Furnish two of each key.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Eaton Electrical/Cutler-Hammer: www.eatonelectrical.com.

B. GE Industrial: www.geindustrial.com.

C. Square D: www.squared.com.

2.2 SWITCHBOARDS

A. Description: Switchboard with electrical ratings and configurations as indicated and specified on drawing documents.

B. Ratings:

1. Voltage: 120/208 volts.

2. Configuration: Three phase, four wire, grounded.

3. Main Bus: 1000 amperes.

4. Integrated Equipment Rating: 200,000 rms amperes symmetrical.

C. Main Section Devices: Panel mounted.

D. Distribution Section Devices: Panel mounted.

E. Auxiliary Section Devices: Individually mounted.

F. Bus Material: Aluminum with tin plating, standard size.

G. Bus Connections: Bolted, accessible from front for maintenance.

H. Fully insulate load side bus bars. Do not reduce spacing of insulated bus.

I. Ground Bus: Extend length of switchboard.

J. Insulated Ground Bus: Extend length of switchboard.

K. Fusible Switch Assemblies: NEMA KS 1, load interrupter enclosed knife switch with externally operable handle. Provide interlock to prevent opening front cover with switch in ON position. Handle lockable in OFF position. Fuse clips: Designed to accommodate Class R fuses, type as specified.

L. Fusible Switch Assemblies, 800 Amperes and Larger: Bolted pressure contact switches. Fuse clips: Designed to accommodate Class L fuses.

M. Molded Case Circuit Breakers: Integral thermal and instantaneous magnetic trip in each pole.

1. Provide circuit breakers UL listed as Type HACR for air conditioning equipment branch circuits.

2. Include shunt trip and undervoltage release where indicated.

N. Molded Case Circuit Breakers with Current Limiters: With replaceable current limiting elements; UL listed.

1. Integral thermal and instantaneous magnetic trip in each pole.

2. Include shunt trip and undervoltage release where indicated.

O. Current Limiting Molded Case Circuit Breakers: UL listed.

1. Integral thermal and instantaneous magnetic trip in each pole, coordinated with automatically resetting current limiting elements in each pole.

2. Interrupting rating 100,000 rms amperes symmetrical let-through current and energy level less than permitted for same size Class RK-5 fuse.

3. Include shunt trip and undervoltage release where indicated.

P. Solid-State Molded Case Circuit Breakers: With electronic sensing, timing and tripping circuits for adjustable current settings; UL listed.

1. Ground fault trip, ground fault sensing integral with circuit breaker or sequence type ground fault sensors.

2. Instantaneous trip.

3. Adjustable short time trip.

4. Stationary mounting; Drawout construction.

5. Include shunt trip and undervoltage release where indicated.

Q. Line and Load Terminations: Accessible from the front only of the switchboard, suitable for the conductor materials and sizes indicated.

R. Ground Fault Sensor: Zero sequence; Ground return type.

S. Ground Fault Relay: Adjustable ground fault sensitivity from 200 to 1200 amperes, time delay adjustable from 0 to 15 seconds. Provide monitor panel with lamp to indicate relay operation, TEST and RESET control switches.

T. Metering Transformer Compartment: For utility company's use; compartment size, bus spacing and drilling, door, and locking and sealing requirements in accordance with utility company's requirements.

U. Pull Section:

1. In accordance with utility company's requirements.

V. Future Provisions: Fully equip spaces for future devices with bussing and bus connections, suitably insulated and braced for short circuit currents. Provide continuous current rating as indicated.

W. Enclosure: Type 1 - General Purpose; Type 3R - Raintight.

1. Align sections at rear only.

2. Switchboard Height: 90 inches (2250 mm), excluding floor sills, lifting members and pull boxes.

3. Finish: Manufacturer's standard light gray enamel over external surfaces. Coat internal surfaces with minimum one coat corrosion-resisting paint, or plate with cadmium or zinc.

2.3 SOURCE QUALITY CONTROL

A. Shop inspect and test switchboard according to NEMA PB 2.

B. Make completed switchboard available for inspection at manufacturer's factory prior to packaging for shipment. Notify engineer at least 7 days before inspection is allowed.

C. Allow witnessing of factory inspections and tests at manufacturer's test facility. Notify engineer at least 7 days before inspections and tests are scheduled.

PART 3 EXECUTION

3.1 PREPARATION

A. Provide concrete housekeeping pad under the provisions of Section 03300.

B. Verify that field measurements are as indicated on shop drawings.

3.2 INSTALLATION

A. Install switchboard in locations shown on drawings, according to NEMA PB 2.1.

B. Install in a neat and workmanlike manner, as specified in NECA 400.

C. Tighten accessible bus connections and mechanical fasteners after placing switchboard.

D. Install fuses in each switch.

3.3 FIELD QUALITY CONTROL

A. Perform field inspection and testing in accordance with Section 01400.

B. Inspect and test in accordance with NETA STD ATS, except Section 4.

C. Perform inspections and tests listed in NETA STD ATS, Section 7.1.

3.4 ADJUSTING

A. Adjust all operating mechanisms for free mechanical movement.

B. Tighten bolted bus connections in accordance with manufacturer's instructions.

C. Adjust circuit breaker trip and time delay settings to values indicated.

D. Adjust circuit breaker trip and time delay settings to values as instructed by engineer.

3.5 CLEANING

A. Touch up scratched or marred surfaces to match original finish.

END OF SECTION

SECTION 26 27 01
ELECTRICAL UTILITY SERVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Service racks.

B. Metering transformer cabinets.

C. Meter bases.

1.02 REFERENCES

A. NECA 1 - Standard Practices for Good Workmanship in Electrical Contracting; National Electrical Contractors Association; 2006.

B. NFPA 70 - National Electrical Code; National Fire Protection Association; 2005.

1.03 SYSTEM DESCRIPTION

A. System Characteristics: as shown on plans.

B. Service Entrance: as shown on plans

1.04 SUBMITTALS

A. See Division 1- Administrative Requirements, for submittal procedures.

B. Product Data: Provide ratings and dimensions of transformer cabinets and meter bases.

C. Submit utility company-prepared drawings.

1.05 QUALITY ASSURANCE

A. Utility Company: (AHJ) Authority having jurisdiction.

B. Perform work in accordance with utility company written requirements and NFPA 70.

1. Maintain one copy of each document on site.

C. Products: Listed and classified by testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

1.06 PRE-INSTALLATION MEETING

A. Convene one week prior to commencing work of this section. Review service entrance requirements and details with Utility Company representative.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. GE Industrial: www.geindustrial.com.

B. Milbank Manufacturing: www.milbankmfg.com.

C. Square D: www.squared.com.

2.02 COMPONENTS

A. Metering Transformer Cabinets: Sheet metal cabinet with hinged door, conforming to utility company requirements, with provisions for locking and sealing.

1. Size: As required by utility.

B. Meter Base: Furnished by utility company.

C. Utility Transformer Pad: Prefabricated precast concrete transformer pad sized as required by utility company.

D. Other Components: As required by utility company.

PART 3 EXECUTION

3.01 PREPARATION

A. Arrange with utility company to obtain permanent electric service to the Project.

B. Verify that field measurements are as indicated on utility company drawings.

3.02 INSTALLATION

A. Install service rack, weatherhead, transformer pad, metering transformer cabinets, and meter base as required by utility company.

B. Install securely, in a neat and workmanlike manner, as specified in NECA 1.

END OF SECTION

SECTION 26 27 26
WIRING DEVICES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. The provisions of Section 26 05 10, "General Electrical Requirements" and Section 26 05 12, "Basic Electrical Materials and Methods".

1.2 REFERENCES

A. National Electrical Manufacturers Association (NEMA) Wiring Devices (WD).

B. National Fire Protection Association (NFPA) 70.

1.3 SUMMARY

A. Snap Switches (each type and style).

B. Receptacle Outlets (each type and style).

C. Trim a Coverplates (each type and style).

D. All electrical components, devices, and accessories shall be UL listed.

PART 2 PRODUCTS

1.4 WALL SWITCHES:

A. AC general use wall switches shall be toggle handle, quiet operating, premium or heavy duty, specification grade and U.L. listed.

B. All switches shall be rated 120/270 volts 20 ampere. HP ratings shall be 1 for 120 volt and 2 for 240 volt.

C. Single pole switches shall be Hubbell #C1221, Arrow Hart #1991, G.E. #5951 or Equal.

D. Toggle color shall be ivory.

E. Special purpose switches shall be of the type indicated or required for the application shown. All special purpose switches shall be NEMA configuration. Submit on all switches including, but not limited to, the following:

1. Key switches (each type).

1.5 RECEPTACLES OUTLETS:

A. Grounding receptacles shall be, 125 volt, 2 pole, 3 wire, NEMA configuration 5-20R.

1. Receptacles shall be Hubbell #5352 or #5362 as manufactured by Arrow Hart, G.E. or Equal.

B. Receptacle color shall be:

1. Grounding receptacles – ivory.

1.6 TRIM AND COVERPLATES:

A. Provide a trim or coverplate for each outlet, switch device and box. Ganged devices shall be hang plates exactly matching the arrangement and quantity of devices. Plates on unfinished walls shall be zinc-coated sheet steel having round or beveled edges. Plates on finished walls shall be satin finish stainless steel, minimum 0.032-inch thick. Screws shall be tamper proof (ratings for use as detention security devices), countersunk heads in a color to match the finish of the plate.

B. Plates for special application shall be as indicated on plans or otherwise specified.

C. All plates shall fit the box perfectly with no field modification necessary. Surface plates shall not overhang the box.

D. Covers for weatherproof receptacles shall be such that the weatherproof integrity of the receptacles is maintained while in use. Covers shall be manufactured by G.E. #9226-5, Bell #245 or equal.

PART 3 EXECUTION

1.7 INSTALLATION

A. Install all switch and receptacle outlets in the vertical position unless otherwise shown on the drawings. All devices and trim shall be square and level.

B. Adjacent devices, mounted at the same elevation, shall be provided with a single, common trimplate.

C. Grounding Receptacle:

1. The green insulated ground (bond) wire shall be spliced together within the outlet box. A green insulated bonding jumper shall be provided from the splice to the box body. Attachment to the box body shall be provided using a tapped #10-32 x 3/8" screw minimum.

2. A green insulated bonding jumper shall be provided from the splice to the receptacle ground screw.

1.8 TESTING:

A. Test all devices in accordance with section 26 05 10, "General Electrical Requirements", and Section 26 05 12, "Basic Electrical Materials and Methods".

END OF SECTION 26 27 26 WIRING DEVICES

SECTION 26 51 00
INTERIOR LIGHTING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes interior lighting fixtures, lamps, ballasts, emergency lighting units, and accessories.

B. Related Sections include the following:

1. Division 26 Section 26 09 23 – Lighting Control Devices for basic single and dual circuit programmable lighting controls, time switches, additional photoelectric relays, power relays, and contactors.

1.3 SUBMITTALS

A. Product Data: For each type of lighting fixture indicated, arranged in order of fixture designation, to conform with requirements of Division 1 – Submittal Requirements. Include data on features, accessories, and the following:

1. Dimensions of fixtures.
2. Certified results of laboratory tests for fixtures and lamps for photometric performance.
3. Emergency lighting unit battery and charger.
4. Fluorescent and high-intensity-discharge ballasts.
5. Sound Performance Data: For air-handling fixtures. Indicate sound power level and sound transmission class in test reports certified according to ADC.
6. Types of lamps.

B. Shop Drawings: Provide detailed drawings for fixtures requiring non-standard mounting.

C. Coordination Drawings: Reflected ceiling plans and sections drawn to scale and coordinating fixture installation with ceiling grid, ceiling-mounted items, and other components in the vicinity. Include work of all trades that is to be installed near lighting equipment.

D. Samples for Verification: For lighting fixtures designated for sample submission in the Interior Lighting Fixture Schedule.

1. Lamps: Specified units installed.
2. Ballast: 277-V or 120-V model of specified ballast type.
3. Accessories: As applicable.

E. Product Certificates: Signed by manufacturers of lighting fixtures certifying that products comply with all specified requirements (including non-interference with hearing-aids).

F. Field Test Reports: Indicate and interpret test results for compliance with lighting system performance requirements.

G. Maintenance Data: For lighting fixtures to include in maintenance manuals specified in Division 1.

1.4 QUALITY ASSURANCE

A. Fixtures, Emergency Lighting Units, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.

B. Comply with NFPA 70.

C. FM Compliance: Fixtures for hazardous locations (including mechanical rooms) shall be listed and labeled for indicated class and division of hazard by FM.

D. NFPA 101 Compliance: Comply with visibility and luminance requirements for exit signs.

E. Mockups: Provide lighting fixtures for room or module mockups. Install fixtures for mockups with power and control connections.

1. Obtain District's approval of fixtures for mockups before starting installations.

2. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.

3. Remove mockups when directed. Fixtures may be reinstalled in the Work with approval of Architect.

4. Approved fixtures in mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 WARRANTY

A. General Warranty: Special warranties specified in this Article shall not deprive District of other rights District may have under other provisions of the Contract Documents and State of California Contract Law, and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Special Warranty for Batteries: Written warranty, executed by manufacturer, agreeing to replace rechargeable batteries that fail in materials or workmanship within specified warranty period.

1. Special Warranty Period for Batteries: Manufacturer's standard, but not less than 10 years from date of Substantial Completion. Full warranty shall apply for first year, and prorated warranty for last nine years.

C. Special Warranties for Fluorescent Ballasts: Written warranty, executed by manufacturer, agreeing to replace fluorescent ballasts that fail in materials or workmanship within specified warranty period.

1. Special Warranty Period for Electronic Ballasts: Five years from date of manufacture, but not less than four years from date of Substantial Completion.

2. Special Warranty Period for Electromagnetic Ballasts: Manufacturers' standard warranty, but not less than two years from date of manufacture.

1.6 EXTRA MATERIALS

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

1. Lamps: 5 for every 100 of each type and rating installed. Furnish at least one of each type.

2. Plastic Diffusers and Lenses: 1 for every 100 of each type and rating installed. Furnish at least one of each type.

3. Battery and Charger Data: For emergency lighting units.

4. Ballasts: 1 for every 100 of each type and rating installed. Furnish at least one of each type.

5. Globes and Guards: 1 for every 20 of each type and rating installed. Furnish at least one of each type.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products indicated for each designation in the Interior Lighting Fixture Schedule.

2.2 FIXTURES AND FIXTURE COMPONENTS, GENERAL

A. Metal Parts: Free from burrs, sharp corners, and edges.

B. Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging.

C. Doors, Frames, and Other Internal Access: Smooth operating, free from light leakage under operating conditions, and arranged to permit re-lamping without use of tools. Arrange doors, frames, lenses, diffusers, and other pieces to prevent accidental falling during re-lamping and when secured in operating position.

D. Reflecting Surfaces: Minimum reflectance as follows, unless otherwise indicated:

1. Polished aluminum

2. Surfaces: 90 percent reflectance.

E. Lenses, Diffusers, Covers, and Globes: 100 percent virgin acrylic plastic, unless otherwise indicated.

1. Plastic: High resistance to yellowing and other changes due to aging, exposure to heat, and ultraviolet radiation.

2. Lens Thickness: 0.125 inch minimum, unless greater thickness is indicated.

2.3 FLUORESCENT LAMP BALLASTS

A. General Requirements: Unless otherwise indicated, features include the following:

1. Designed for type and quantity of lamps indicated at full light output.

2. Power Factor: 98 Percent, minimum.

3. Total Harmonic Distortion Rating: Less than 10 percent.

4. Sound Rating: A.

B. Electronic Ballasts for Linear Fluorescent Lamps: Unless otherwise indicated, features include the following, besides those in "General Requirements" Paragraph above:

1. Certified Ballast Manufacturer Certification: Indicated by label.

2. Encapsulation: Without voids in potting compound.

3. Parallel Lamp Circuits: Multiple lamp ballasts connected to maintain full light output on surviving lamps if one or more lamps fail.

4. Flicker: No visible flicker.

C. Electromagnetic Ballasts for Linear Lamps: Unless otherwise indicated, features include the following, besides those in "General Requirements" Paragraph above:

1. Type: Energy saving.

2. Certified Ballast Manufacturer Certification: Indicated by label.

3. Encapsulation: Without voids in potting compound.

D. Ballasts for Compact Lamps is Recessed Fixtures: Unless otherwise indicated, additional features include the following:

1. Type: Electronic or electromagnetic, fully encapsulated in potting compound.

2. Power Factor: 90 percent, minimum.

3. Operating Frequency for Electronic Ballasts: 20 kHz or higher.

4. Total Harmonic Distortion Rating: Less than 20 percent.

5. Flicker: No visible flicker.

6. Lamp Current Crest Factor: Less than 1.7.

7. Transient Protection: Comply with IEEE C62.41 for Category A1 locations.

8. Interference: Comply with 47 CFR, Chapter 1, Part 18, Subpart C for limitations on electromagnetic and radio-frequency interference for non-consumer equipment.

E. Ballasts for Compact Lamps in Non-recessed Fixtures: Unless otherwise indicated, additional features include the following:

1. Power Factor: 90 percent, minimum.

2. Ballast Coil Temperature: 65 deg C, maximum.

3. Transient Protection: Comply with IEEE C62.41 for Category A1 locations.

4. Interference: Comply with 47 CFR, Chapter 1, Part 18, Subpart C for limitations on electromagnetic and radio-frequency interference for non-consumer equipment.

F. Ballasts for Dimmer-Controlled Fixtures: Unless otherwise directed, dimming ballasts for fluorescent fixtures shall not be used.

G. Ballasts for Low Electromagnetic Interference Environments: Comply with 47 CFR, Chapter 1, Part 18, Subpart C for limitations on electromagnetic and radio-frequency interference for consumer equipment.

2.4 HIGH-INTENSITY-DISCHARGE (HID) LAMP BALLASTS

A. General: Comply with ANSI C82.4. Unless otherwise indicated, features include the following:

1. Type: Two-stage constant-wattage autotransformer or regulating high-power-factor type, unless otherwise indicated.

2. Operating Voltage: Match system voltage.

3. Minimum Starting Temperature: Minus 22 deg F for single lamp ballasts.

4. Normal Ambient Operating Temperature: 104 deg F.

5. Open-circuit operation that will not reduce average life.

6. Auxiliary, Instant-on, Quartz System: Automatically switches quartz lamp on when fixture is initially energized and when momentary power outages occur. Automatically turns quartz lamp off when high-intensity-discharge lamp reaches approximately 60 percent light output.

B. Encapsulation: Manufacturer's standard epoxy-encapsulated model designed to minimize audible fixture noise.

2.5 EXIT SIGNS

A. General Requirements: Comply with UL 924 and the following:

1. Sign Colors and Lettering Size: Red letters. Letter size to comply with applicable regulations.

B. Internally Lighted Signs: As follows:

1. Lamps for AC Operation: Light-emitting diodes, 70,000 hours minimum rated lamp life.

C. Self-Powered Exit Signs (Battery Type): Integral automatic charger in a self-contained power pack.

1. Battery: Sealed, maintenance-free, nickel-cadmium type with special warranty.

2. Charger: Fully automatic, solid-state type with sealed transfer relay.

3. Operation: Relay automatically energizes lamp from unit when circuit voltage drops to 80 percent of nominal or below. When normal voltage is restored, relay disconnects lamps, and battery is automatically recharged and floated on charger.

2.6 LAMPS

A. Fluorescent Color Temperature and Minimum Color-Rendering Index: 3500 K and 85 CRI, unless otherwise indicated.

B. Non-compact Fluorescent Lamp Life: Rated average is 20,000 hours at 3 hours per start when used on rapid-start circuits.

C. Metal-Halide Color Temperature and Minimum Color-Rendering Index: 3600 K and 70 CRI, unless otherwise indicated.

2.7 FIXTURE SUPPORT COMPONENTS

A. Comply with Section 26 05 12 – "Basic Electrical Materials and Methods," for channel- and angle-iron supports and nonmetallic channel and angle supports.

B. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fitting and ceiling canopy. Finish same as fixture.

C. Twin-Stem Hangers: Two, 1/2-inch steel tubes with single canopy arranged to mount a single fixture. Finish same as fixture.

D. Rod Hangers: 3/16-inch- minimum diameter, cadmium-plated, threaded steel rod.

E. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

F. Aircraft Cable Support: Use cable, anchorages, and intermediate supports recommended by fixture manufacturer.

2.8 FINISHES

A. Fixtures: Manufacturer's standard, unless otherwise indicated.

1. Paint Finish: Applied over corrosion-resistant treatment or primer, free of defects.

2. Metallic Finish: Corrosion resistant.

PART 3 EXECUTION

3.1 INSTALLATION

A. Fixtures: Set level, plumb, and square with ceiling and walls, and secure according to manufacturer's written instructions and approved submittal materials. Install lamps in each fixture.

B. Support for Fixtures in or on Grid-Type Suspended Ceilings: Use grid for support.

1. Install a minimum of four ceiling support system rods or wires for each fixture. Locate not more than 6 inches from fixture corners. Conform with requirements of Division 1 Seismic Requirements.

2. Support Clips: Fasten to fixtures and to ceiling grid members at or near each fixture corner.

3. Fixtures of Sizes Less Than Ceiling Grid: Arrange as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4-inch metal channels spanning and secured to ceiling tees.

C. Suspended Fixture Support: As follows:

1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.

2. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.

3. Continuous Rows: Suspend from cable installed according to fixture manufacturer's written instructions and details on Drawings.

3.2 CONNECTIONS

A. Ground equipment.

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.3 FIELD QUALITY CONTROL

A. Inspect each installed fixture for damage. Replace damaged fixtures and components.

B. Advance Notice: Give dates and times for field tests.

C. Provide instruments to make and record test results.

D. Tests: As follows:

1. Conform with Division 1 – Building System Commissioning Program.

2. Verify normal operation of each fixture after installation.

3. Emergency Lighting: Interrupt electrical supply to demonstrate proper operation.

4. Verify normal transfer to battery source and retransfer to normal.

5. Report results in writing.

E. Malfunctioning Fixtures and Components: Replace or repair, then retest. Repeat procedure until units operate properly.

F. Corroded Fixtures: Replace during warranty period.

3.4 CLEANING AND ADJUSTING

A. Clean fixtures internally and externally after installation. Use methods and materials recommended by manufacturer.

B. Adjust aimable fixtures to provide required light intensities.

3.5 INTERIOR LIGHTING FIXTURE SCHEDULE

A. Fixture Type: Commercial full-size fluorescent.

1. Products: Available products include the following:
   a. Day-Brite
   b. Lightolier
   c. Hubbell
2. Voltage: Per drawings.
3. Mounting: (Per Drawings)
4. Nominal Dimensions: Per drawings.
5. Lamps: Number and type per drawings.
6. Lens: Per drawings.
7. External Finish: High-gloss white polyester paint.
8. Trim and Hardware: Per drawings.
9. Minimum Coefficient of Utilization (CU) for Typical Room Cavity Ratios (RCR) Are as Follows (Typical cavity reflectances are ceiling = 80 percent, wall = 50 percent, and floor = 20 percent):
   a. RCR 3: .64 CU.
   b. RCR 5: .52 CU.
   c. RCR 7: .43 CU.
10. Minimum Spacing/Mounting Height (MH) Ratio: 1.4.
11. Minimum Visual Comfort Probability (VCP): 70.
12. Maximum Luminance Ratio: 5.
13. Samples: Not required.
14. Mockups: Not required.

B. Fixture Type: Industrial full-size fluorescent.

1. Products:
   a. Lithonia
   b. Metalux
   c. Day-Brite/Benjamin
   d. Hubbell

2. Voltage: Per drawings.
3. Mounting: Pendant, Surface ceiling, Suspended.
4. Nominal Dimensions: Per drawings.
5. Lamps: Number and type per drawings.
6. Ballast Types and Features: Electronic.
7. External Finish: High-gloss white polyester paint.
8. Trim and Hardware: Per drawings.
9. Minimum Coefficient of Utilization (CU) for Typical Room Cavity Ratios (RCR) Are as Follows (Typical cavity reflectances are ceiling = 80 percent, wall = 50 percent, and floor = 20 percent):
   a. RCR 3: .76 CU.
   b. RCR 5: .62 CU.
   c. RCR 7: .51 CU.
10. Minimum Spacing/Mounting Height (MH) Ratio: 1.4.
11. Minimum Visual Comfort Probability (VCP): 70.
12. Samples: Not required.
13. Mockups: Not required.

C. Fixture Type: Compact fluorescent.
1. Products: Available products include the following:
   a. Westerfield
   b. Halo
   c. Omega
   d. Capri
2. Voltage: Per drawings.
3. Mounting: Surface ceiling, Surface wall.
4. Nominal Dimensions: Per drawings.
5. Lamps: Per drawings.
6. Ballast Types and Features: Electromagnetic.
7. Lens: Translucent white or clear per drawings.
8. External Finish: White powder coat polyester paint.
9. Samples: Required.
10. Mockups: Not required.

D. Fixture Type: Indoor High Intensity Discharge.
1. Products: Available products include the following:
   a. Lithonia
   b. Day-Brite

c. Lightolier

2. Voltage: Per drawings.

3. Mounting: Suspended.

4. Nominal Dimensions: Per drawings.

5. Lamps: 1, wattage per drawings.

6. Ballast Types and Features: See Part 1, Section 2.4

7. Lens: Prismatic, borosilicate glass reflector.

8. External Finish: White polyester paint.

9. Minimum Coefficient of Utilization (CU) for Typical Room Cavity Ratios (RCR) Are as Follows (Typical cavity reflectances are ceiling = 80 percent, wall = 50 percent, and floor = 20 percent):

a. RCR 3: .60 CU.

b. RCR 5: .48 CU.

c. RCR 7: .39 CU.

E. Minimum Spacing/Mounting Height (MH) Fixture Type: Commercial full-size fluorescent.

1. Products: Available products include the following:

a. Lithonia

b. Day-Brite

c. Lightolier

2. Voltage: Per drawings.

3. Mounting: (Per Drawings)

4. Nominal Dimensions: Per drawings.

5. Lamps: Number and type per drawings.

6. Lens: Per drawings.

7. External Finish: High-gloss white polyester paint.

8. Trim and Hardware: Per drawings.

9. Minimum Coefficient of Utilization (CU) for Typical Room Cavity Ratios (RCR) Are as Follows (Typical cavity reflectances are ceiling = 80 percent, wall = 50 percent, and floor = 20 percent):

a. RCR 3: .64 CU.

b. RCR 5: .52 CU.

c. RCR 7: .43 CU.

10. Minimum Spacing/Mounting Height (MH) Ratio: 1.4.

11. Minimum Visual Comfort Probability (VCP): 70.

12. Maximum Luminance Ratio: 5.

13. Samples: Not required.

14. Mockups: Not required.

15. Ratio: Per drawings.
16. Other Requirements: Safety hook.
17. Samples: Not required.
18. Mockups: Not required.

END OF SECTION

OFFICE OF
CLERK OF THE BOARD OF SUPERVISORS
1st FLOOR, COUNTY ADMINISTRATIVE CENTER
P.O. BOX 1147, 4080 LEMON STREET
RIVERSIDE, CA 92502-1147
PHONE: (951) 955-1060
FAX: (951) 955-1071

KECIA HARPER-IHEM
Clerk of the Board of Supervisors

KIMBERLY A. RECTOR
Assistant Clerk of the Board

March 28, 2012

THE PRESS ENTERPRISE
ATTN: LEGALS
PO BOX 792
RIVERSIDE, CA 92501

FAX (951) 368-9018
E-MAIL: legals@pe.com

RE: NOTICE INVITING BIDS: SMITH CORRECTIONAL FACILITY SAFETY CELLS

To Whom It May Concern:

Attached is a copy for publication in your newspaper for **TWO (2) CONSECUTIVE FRIDAYS: MARCH 30 AND APRIL 6, 2012.**

We require your affidavit of publication immediately upon completion of the last publication.

Your invoice must be submitted to this office in duplicate, WITH TWO CLIPPINGS OF THE PUBLICATION.

NOTE: PLEASE COMPOSE THIS PUBLICATION INTO A SINGLE COLUMN FORMAT.

Thank you in advance for your assistance and expertise.

Sincerely,

Mcgil
Cecilia Gil, Board Assistant to
KECIA HARPER-IHEM, CLERK OF THE BOARD

Gil, Cecilia

From: PE Legals <legals@pe.com>
Sent: Wednesday, March 28, 2012 8:17 AM
To: Gil, Cecilia
Subject: RE: FOR PUBLICATION: SMITH CORRECTIONAL FACILITY SAFETY CELLS

Received for publication on March 30 and April 6. Proof with cost to follow.

Thank You!

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Please Note: Deadline is 10:30 AM two (2) business days prior to the date you would like to publish.
Additional days required for larger ad sizes

From: Gil, Cecilia [mailto:CCGIL@rcbos.org]
Sent: Wednesday, March 28, 2012 8:16 AM
To: PE Legals
Subject: FOR PUBLICATION: SMITH CORRECTIONAL FACILITY SAFETY CELLS

Good Morning! Attached is a Notice Inviting Bids, for publication on 2 Fridays: March 30 and April 6, 2012. Please confirm. THANK YOU!

Cecilia Gil

Board Assistant to the
Clerk of the Board of Supervisors
951-955-8464

THE COUNTY ADMINISTRATIVE CENTER IS CLOSED EVERY FRIDAY UNTIL FURTHER NOTICE.
PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING.

NOTICE INVITING BIDS

COUNTY OF RIVERSIDE, herein called Owner, invites sealed proposals for:

LARRY D. SMITH CORRECTIONAL FACILITY – SAFETY CELL CONVERSION

This Project consists of the conversion of a holding cell into two (2) safety cells at the Larry D. Smith Correctional Facility.

Proposals shall be delivered to the Clerk of the Board of Supervisors, on the 1st floor of the County Administrative Center located at 4080 Lemon Street, Riverside, CA 92501 no later than **1:30 pm on Wednesday, May 2, 2012** and will be promptly opened in public at said address.

Each Proposal shall be in accordance with the Plans, Specifications, and other Contract Documents and prepared by the Economic Development Agency, County of Riverside. A nonrefundable fee of ($45.00) will be charged for each set of Plans and Specifications furnished to Contractors. An additional nonrefundable fee will be charged for each set of Plans and Specifications furnished that are requested to be mailed to Contractors. Plans and Specifications may be obtained from Mission Reprographics, 2050 E. La Cadena Drive Suite L Riverside, CA 92507, 951-686-8828.

Pursuant to the Labor Code, the Governing Board of the Owner has obtained from the Director of the Department of Industrial Relations, State of California, his determination of general prevailing rates of per diem wages applicable to the work, and for holiday and overtime work, including employer payments for health and welfare, pension, vacation, and similar purposes, as set forth on the schedule which is on file at the principal office of the Owner, and which will be made available to any interested person upon request.

The Contract General Conditions for this project will contain provisions allowing successful contractor to substitute securities for monies withheld by the County to ensure performance (Public Contract Code 22300).

A Performance Bond and Payment Bond shall be required for this Project.

The Contractor will be required, per Public Contracts Code, Section 3300 and for this contract, to have a State of California contractor's license classification B – General Building Contractor. A **mandatory** pre-bid job walk inspection will be held on **April 18, 2012, at 10:00 a.m.**, meeting at **1627 S. Hargrave Street, Banning, CA 92220. We will meet outside of the guard Shack on the parking lot. No bids will be accepted from bidders who have not attended the pre-bid job walk.**

All Request of Information (RFI) should be emailed to both Frank J. Gonzales, EDA Project Manager at fgonzales@rivcoeda.org and Tony Finaldi of STK Architecture, Inc. at tfinaldi@stkinc.com . RFIs will not be answered via phone calls. Deadline for submission of BID RFI is **April 25, 2012 at 10:00 am.**

For further information, contact Frank J. Gonzales Project Manager at the Economic Development Agency, Project Management Office at 3403 10th Street Suite 500, Riverside, CA 92501 whose telephone number is (951) 955-8467 and email is fgonzales@rivcoeda.org.

Dated: March 28, 2012

Kecia Harper-Ihem, Clerk of the Board
By: Cecilia Gil, Board Assistant