

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

409



SUBMITTAL DATE:

December 28, 2011

FROM: Economic Development Agency

SUBJECT: Probation Department Southwest Juvenile Hall Security Camera Project - Plans and Specifications

RECOMMENDED MOTION: That the Board of Supervisors:

1. Approve the plans and specifications for the Southwest Juvenile Hall Security Camera Upgrade Project;
2. Upon Completion of the bid process, authorize the Assistant County Executive Officer/EDA to submit the contract for award of the bid to the lowest responsive and responsible bidder to the Chairman of the Board, and authorize the Chairman to execute the agreement on behalf of the board; provided that, if any of the following occur, the award will be submitted to the Board for action: there is a bid protest, the lowest bid exceeds the estimated construction budget, the low bidder is disqualified, two or more bids are the same and are the lowest, or a bidder requests relief from its bid due to an error; and

(Continued)

Robert Field

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: 30% Capital Improvement-General Fund Designation Funds; 70% Probation Department Funds	Positions To Be Deleted Per A-30	<input type="checkbox"/>
	Requires 4/5 Vote	<input type="checkbox"/>

C.E.O. RECOMMENDATION: APPROVE
 BY: *Jennifer L. Sargent*
 County Executive Office Signature

MINUTES OF THE BOARD OF SUPERVISORS

On motion of Supervisor Ashley, seconded by Supervisor Buster and duly carried, IT WAS ORDERED that the above matter is approved as recommended.

Ayes: Buster, Stone, Benoit and Ashley
 Nays: None
 Absent: Tavaglione
 Date: January 10, 2012
 xc: EDA, Probation

Kecia Harper-Ihem
 Clerk of the Board
 By: *Kecia Harper-Ihem*
 Deputy

Prev. Agn. Ref.: 3.21 of 4/26/11; 3.14 of 10/6/09 | District: 3 | Agenda Number: **3.22**

ATTACHMENTS FILED
WITH THE CLERK OF THE BOARD

FORM APPROVED COUNTY COUNSEL
 BY: *Alvin Victor*
 MARSHAL VICTOR
 DATE: 12/8/11
 Departmental Concurrence

By: *Alan M. Crogan*
 Alan M. Crogan, Chief Probation Officer
 Riverside County Probation Department

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



RECOMMENDED MOTION: (Continued)

3. Delegate project management authority for this project to the Assistant County Executive Officer/EDA in accordance with applicable Board policies.

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 MRC Engineering Inc. from the pre-qualified list to provide design services for the Probation Department Southwest Juvenile Hall Security Camera project.

On April 26, 2011, the Board of Supervisors authorized EDA to proceed with the Probation Department Southwest Juvenile Hall Security Camera Project, and approved a total project budget of \$665,000.

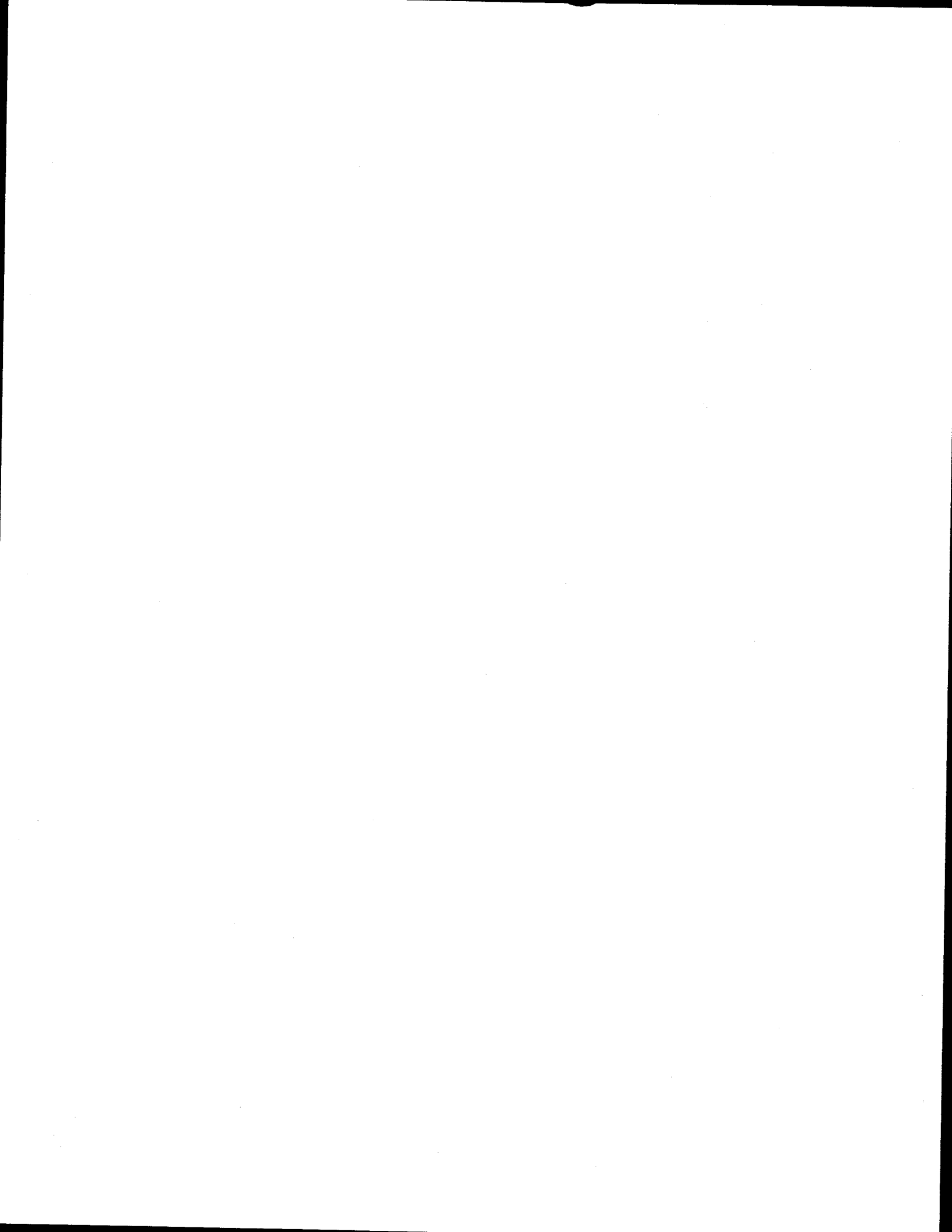
MRC Engineering, Inc. has completed the drawings and specifications, and EDA requests approval to solicit bids for construction of this project. In order to expedite this project and get the new security and monitoring system installed, staff recommends that the Board of Supervisors authorize the Assistant County Executive Officer/EDA to determine the award of the project in accordance with Board Policy B-11, and authorize the Chairman of the Board to execute the agreement on behalf of the Board of Supervisors, provided that the lowest bid falls within the allotted project budget amount for construction.

EDA staff recommends that the Board of Supervisors approve the plans and specifications and authorize the Clerk of the Board to advertise the Notice Inviting Bids for the project.

All costs associated with this project will be funded with 30% Capital Improvement-General Fund Designation Funds and 70% Probation Department Funds, thus no additional net county costs will be incurred.

Attachments:

Specifications



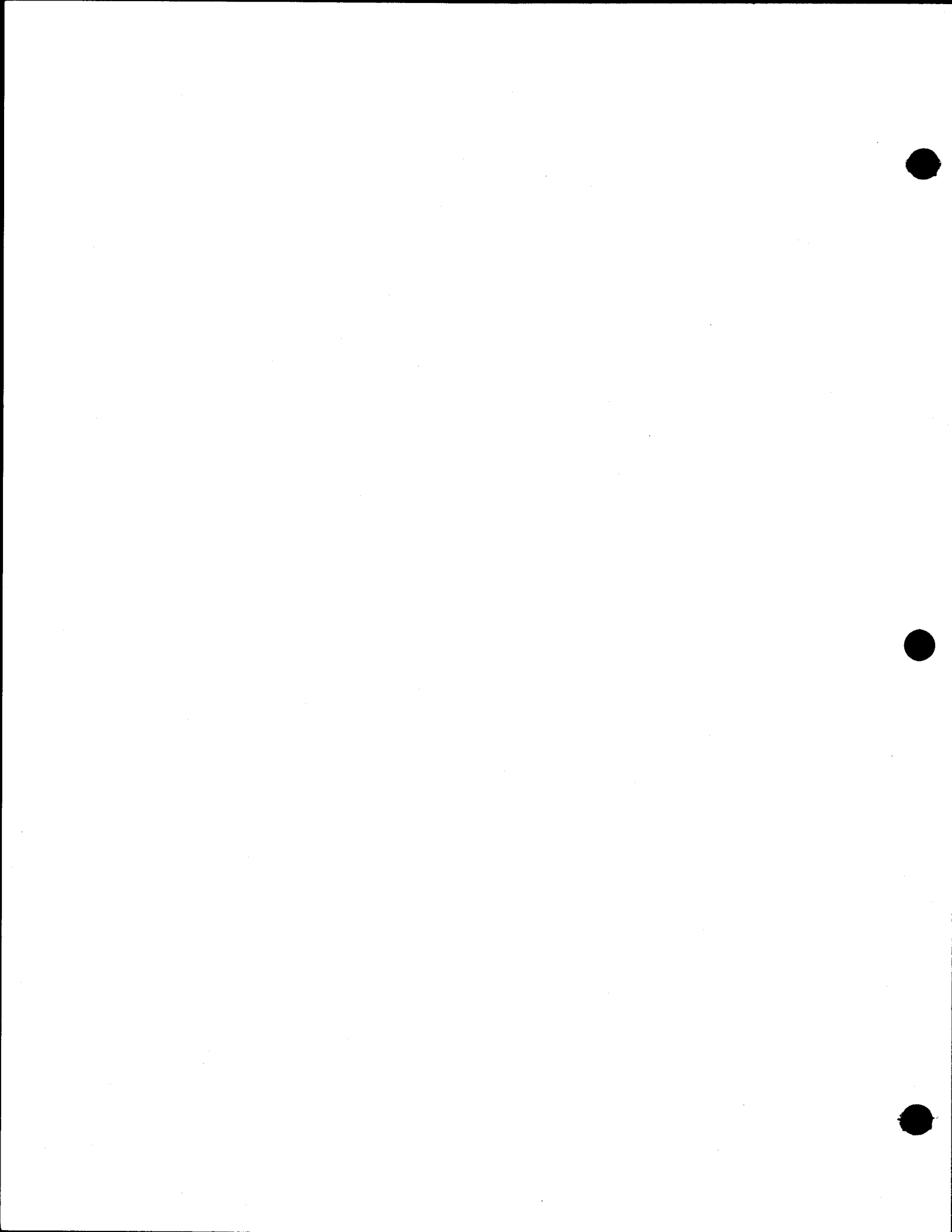
409

SPECIFICATIONS AND CONTRACT DOCUMENTS
FOR
County of Riverside
Southwest Juvenile Detention Center
Security Camera System Upgrade Project



PREPARED BY
MRC Engineering and the County of Riverside
Economic Development Agency
Project Management Office
NOVEMBER 2011

FORM APPROVED COUNTY COUNSEL
BY: MARSHAL VICTOR 12/8/11
DATE



NOTICE INVITING BIDS

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

Southwest Juvenile Detention Center Security Camera System Upgrade Project

This Project is to remove and replace existing outdated security camera system and to install new CCTV System and server room.

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 10:00 am on January ___ 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 (\$35.00) 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:

ARC
4295 Main Street
Riverside CA 92501
Phone: 951-686-0530
Email: riverside.digiprint@e-arc.com

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 January ___, 2012 at 9:00 AM, at County of Riverside Southwest Juvenile Probation Center, **30755D Auld Road, Murrieta, California.** **No bids will be accepted from bidders who have not attended the pre-bid job walk.**

For further information, contact Tim Warner, Project Manager, at the Economic Development Agency, located at 3403 10th Street, Riverside, CA 92501, whose telephone number is (951) 955-4896



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 fifty dollars (\$) per set plus an additional fee per set for mailing if required. Plans and Specifications may be obtained from:
- ARC
4295 Main Street
Riverside CA 92501
Phone: 951-686-0530
Email: riverside.digiprint@e-arc.com
- All fees are due at the time of request and must be paid by check or money order made payable to ARC.
- 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.
- 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 **Southwest Juvenile Detention Center Security Camera System Upgrade Project**, 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 _____

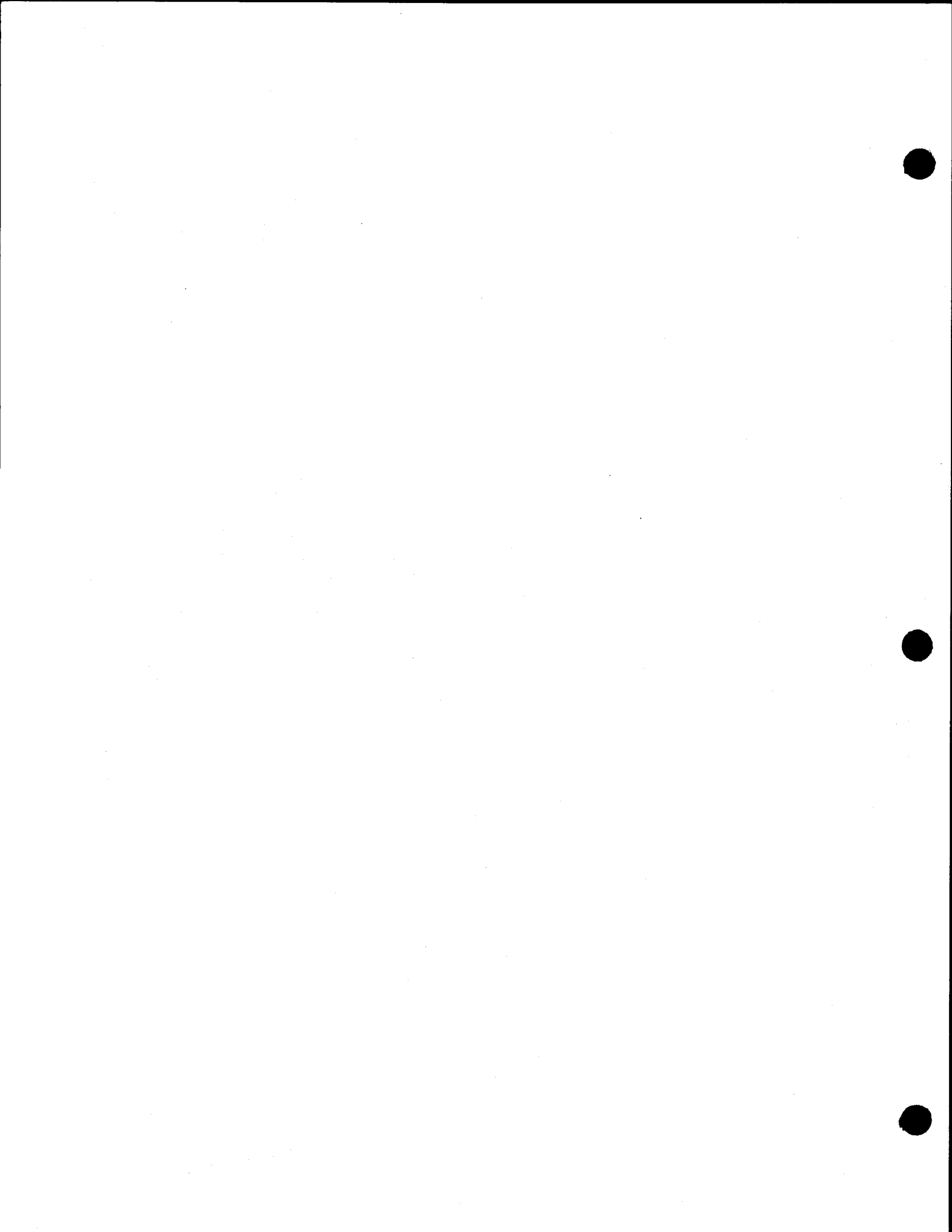
For the total Base Bid _____ dollars (\$ _____), including all applicable taxes, permits, licenses, **AND Course of Construction Insurance.**

(Add or Deduct state which)

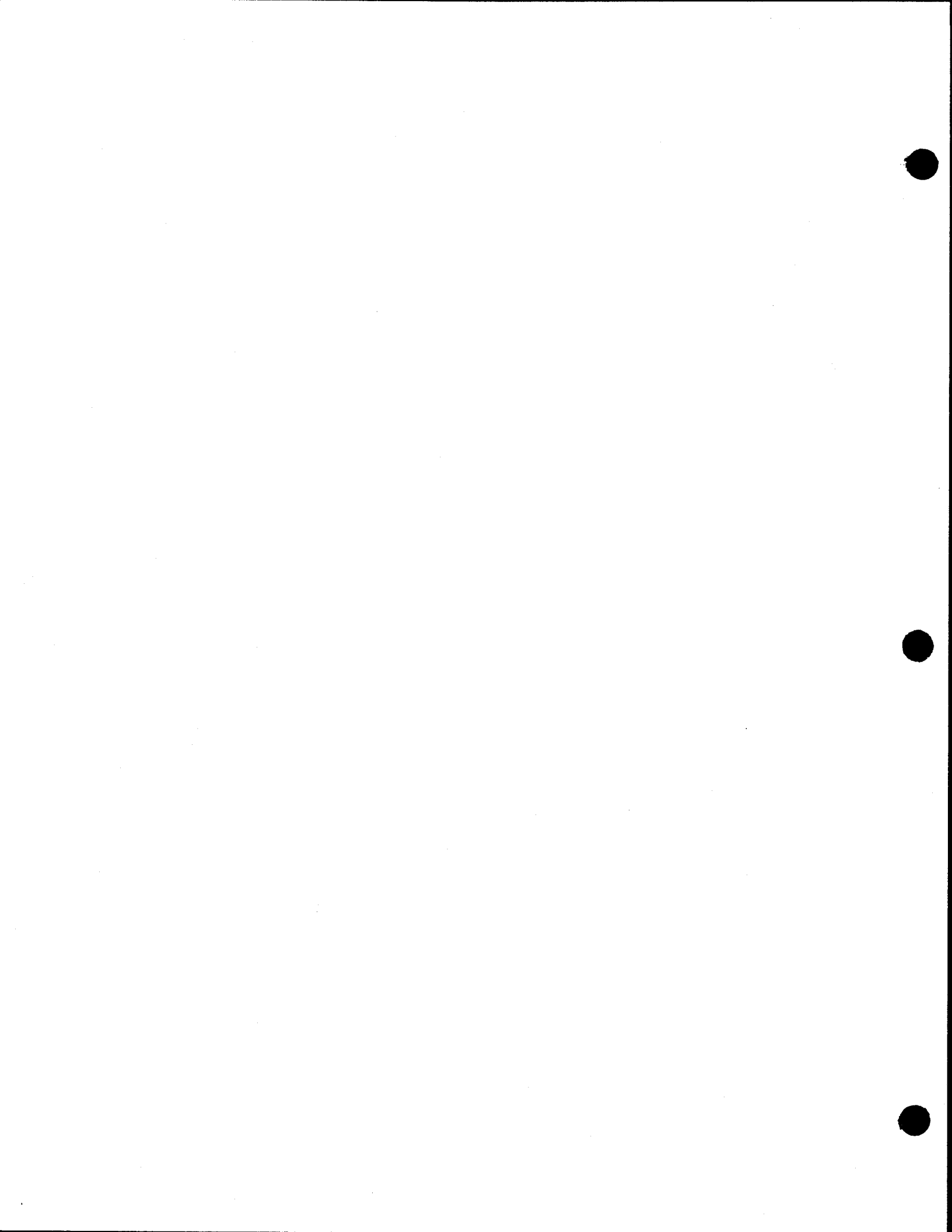
Alternate 1	\$ _____	_____
Alternate 2	\$ _____	_____
Alternate 3	\$ _____	_____
Alternate 4	\$ _____	_____

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.







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: _____

Telephone No.: _____

Contractor's License No.: _____

Classification: _____ Expiration Date: _____

Affix Seal
If
Corporation

LICENSURE STATEMENTS ARE MADE UNDER PENALTY OF PERJURY

If bidder is a corporation, and signer is not 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.



**NONCOLLUSION AFFIDAVIT TO BE EXECUTED BY BIDDER AND
SUBMITTED WITH BID**

State of California) ss.
County of Riverside)

_____, being first duly sworn, deposes and says:

That he or she is _____ of _____
the party making the foregoing bid; that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and 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; that 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, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

Signature

Subscribed and sworn to before me this _____ day of _____, 2012.

Signature of officer administering oath



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 **Southwest Juvenile Detention Center Security Camera System Upgrade Project.**

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)

By _____
(Original Signature)

(Title)

(Corporation Name - Surety)

(Business Address)

By _____
(Original Signature)

Affix Seal
If
Corporation

Affix
Corporate
Seal



AGREEMENT FORM

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

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 **Southwest Juvenile Detention Center Security Camera System Upgrade Project** (.2010002540) in strict accordance with the Plans and Specifications dated November 2011 prepared by MRC Engineering, Inc. & County of Riverside 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 **One Hundred Fifty (150) 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: _____

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: _____

Affix Seal
If
Corporation



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: **Southwest Juvenile Detention Center Security Camera System Upgrade Project.**

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)

By: _____

(Signature - Attach Notary's Acknowledgment)

(Title)

(Corporation Name - Surety)

(Business Address)

By: _____

(Signature - Attached Notary's Acknowledgment)

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

Affix Seal
if
Corporation

Affix
Corporate
Seal



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 **Southwest Juvenile Detention Center Security Camera System Upgrade Project**.

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.)



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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 COUNTY'S 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 Certificate(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 Certificate(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 full force 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, Special 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, fit, 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 fifteen (15) 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 \$750 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

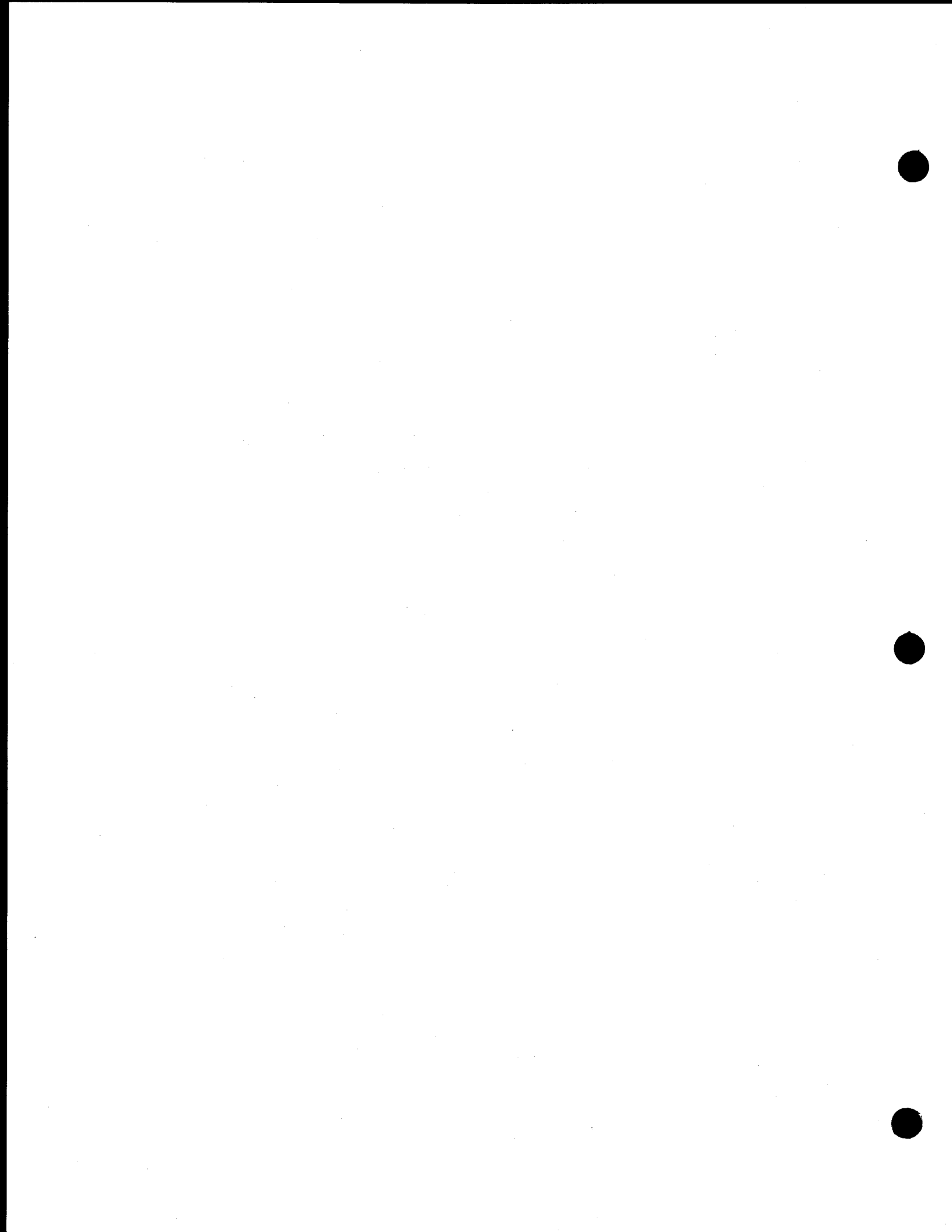
8.3.1 In connecting one kind of work with another, marring or damaging same will not be permitted and, in the event such occurs, shall be corrected by the Contractor at its cost prior to acceptance by the County. Should improper work of any trade be covered by another which results in damage or defects, 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

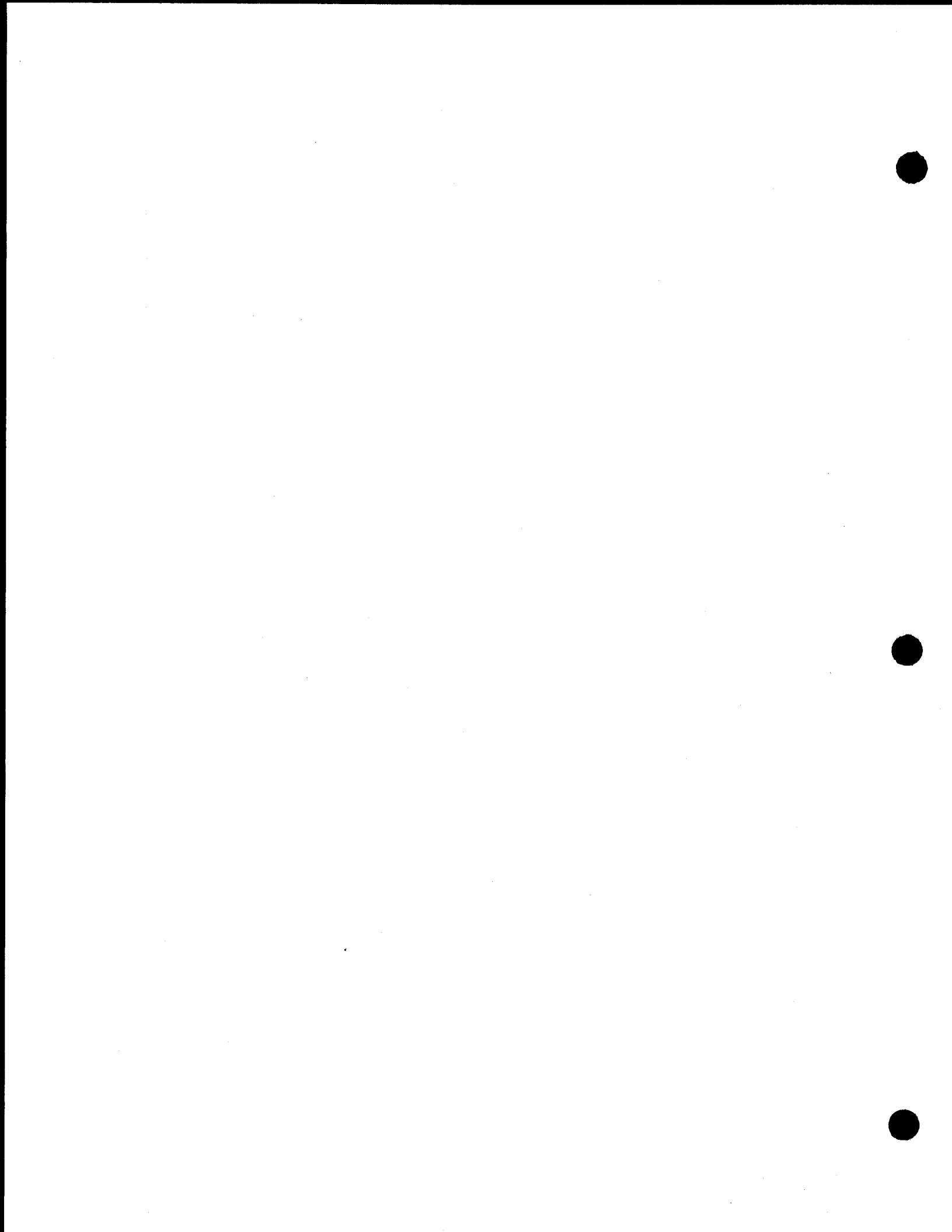
8.13.1 The Contractor shall at all times keep the work area, including storage areas, free from accumulations of waste materials. Before completing the Work, the Contractor shall remove from the work and premises any weeds, rubbish, tools, scaffolding, equipment, and materials that are not the property 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, promotion, 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

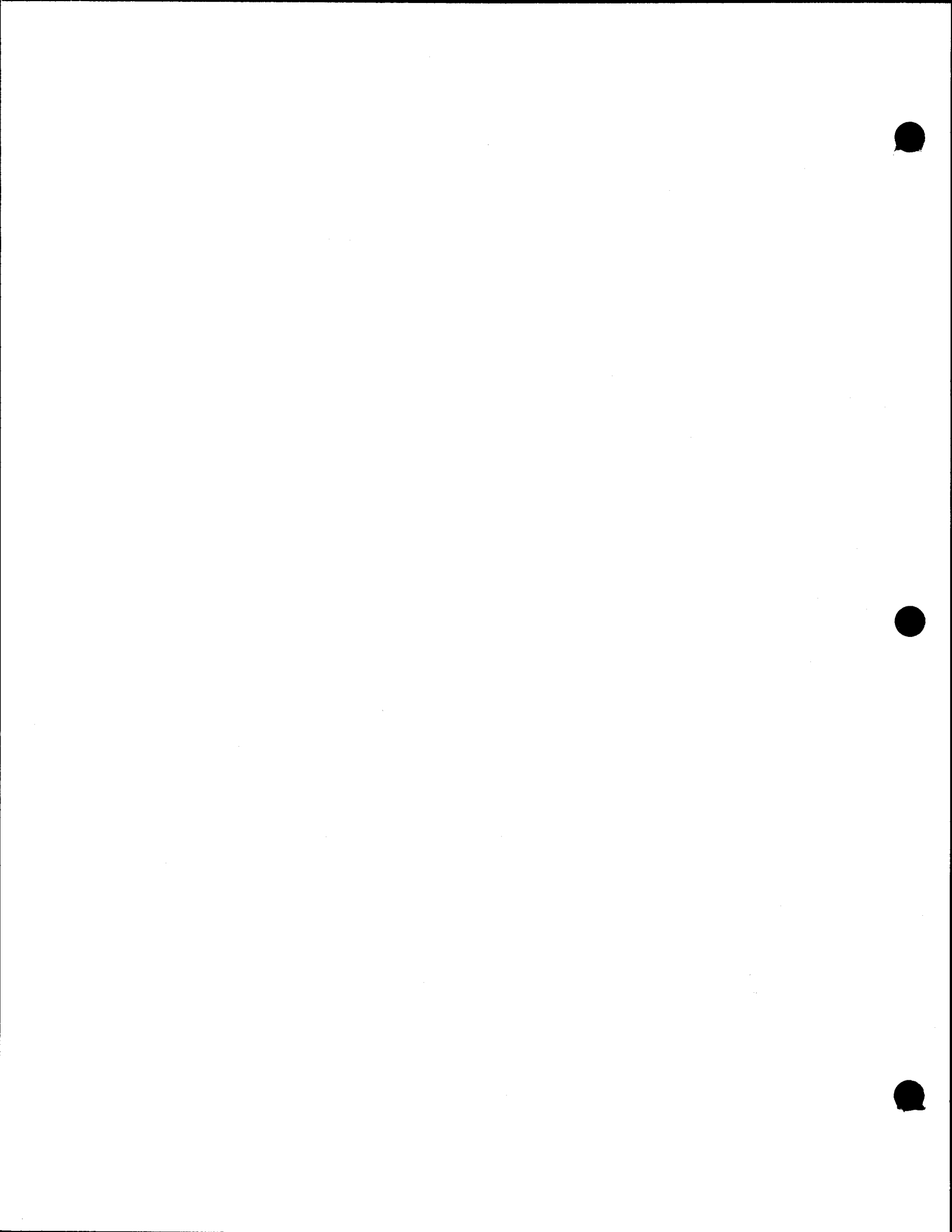
20.1 PROGRESS PAYMENTS

- 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 until the work is 50% complete.
- 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.



- 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.

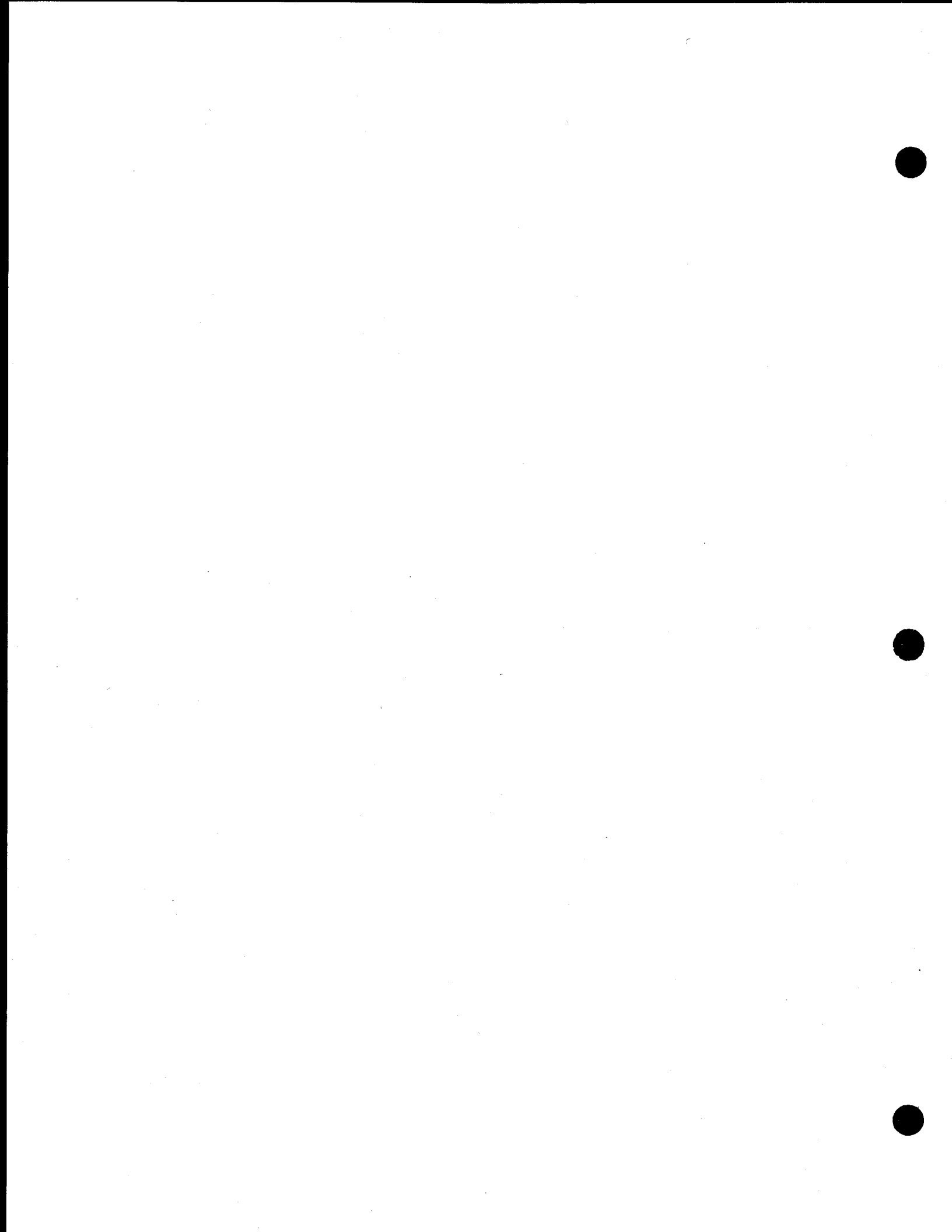
- (6) Complete performance of work not terminated.
 - (7) Take any action that may be necessary, or that the County may direct, for the protection and preservation of the property related to this contract that is in the possession of the Contractor and in which the County has or may acquire an interest.
 - (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.
 1. 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.



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**SECTION 01 11 00
SUMMARY OF WORK AND SPECIAL CONDITIONS**

PART 1 - GENERAL

1.1 WORK INCLUDED:

- A. The Work under this Contract shall include General Construction, Heating and Ventilation, Electrical and Security Camera System in accordance with the Drawings and Specifications prepared by MRC Engineering, Inc.

1.2 SITE:

Project is located on the Site of the existing Facility located at:

**30755D Auld Road
in the City of:
Murrieta, CA 92563**

1.3 CONTRACT DOCUMENTS:

- A. The location of the Work, its general nature and extent, and the form and general dimensions of the project and appurtenant work are shown on the Drawings under the title:

**SOUTHWEST JUVENILE DETENTION CENTER
SECURITY CAMERA SYSTEM UPGRADE**

1.4 CONTRACTOR'S DUTIES:

- A. Except as specifically noted, provide and pay for:
1. Labor, materials and equipment.
 2. Tools, construction equipment and machinery.
 3. Other facilities and services necessary for proper execution and completion of Work.
- B. Give required notices.
- C. Obtain and pay for permits related to City and County, including Business Licenses and hauling and dumping permits, as applicable. Provisions of required permits and licenses, whether obtained by the Owner or the Contractor, shall be a part of the Contract requirements and shall be followed by the Contractor.
- D. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities which bear on performance of Work.
1. Comply with local noise abatement requirements.
- E. Promptly submit written notice to Engineer of any observed variance in Contract Documents from legal requirements. However, it is not Contractor's responsibility to make certain that Drawings and Specifications comply with codes and regulations. Appropriate Modifications to Contract Documents will be issued by the Engineer to make the necessary changes.

1.5 SCHEDULE:

- A. The sequence and scheduling of the work to be performed by the Contractor shall be subject to review by the Engineer and Owner. Submit Progress Schedule in accordance with General Conditions.

PART 2 – SPECIAL CONDITIONS

2.1 CONTRACTOR'S USE OF PREMISES:

- A. Confine operations to the project site. Do not encroach on or do any Work on adjoining property.
- B. Do not unreasonably encumber site with materials or equipment.
- C. Do not load structure with weight that will endanger structure.
- D. Assume full responsibility for protection and safekeeping of products stored on premises.

2.2 DAY TO DAY OPERATION:

- A. The Contractor is advised that the project is part of an existing operational juvenile detention facility. This facility operates 24-hours per day and its continued operation is a project requirement.

2.2 OCCUPIED SITE:

- A. Clients and staff of the facility will use the areas of construction. Pedestrian access around the construction site/area will continue to be used and must be kept open at all times.

2.3 NOISE CONSTRAINTS:

- A. The Contractor is advised that the project is located within an existing operational juvenile detention facility. Noise extraneous to construction proper is not allowed. In addition, there may be noise constraints depending on the time of day.

2.4 HOURS OF WORK:

- A. Hours of Work are to be 8:00 AM to 5:00 PM Monday through Friday.

2.5 CONSTRAINED HOURS:

- A. Hours of work could be constrained by events related to keeping the facility operational. Contractor must provide planning, scheduling and prevention activities in prosecuting the work to achieve required progress and accommodate normal hospital activities.

2.6 UTILITY INTERRUPTIONS:

- A. No unscheduled utility interruptions are anticipated. The facility must be kept operational at all times. Utility work that impacts systems supporting the facility must be addressed through the Method of Procedure Process. "Hot Taps" and other "on-line" methods may be required to maintain uninterrupted service. Any work which may affect existing utilities shall be pre-planned, approved by the MOP process and employ alternative temporary utilities.

2.7 FIRE LANE ACCESS:

- A. The Contractor will be doing work over and around a fire access lane. This lane must be kept free of obstruction at all times. Continuous fire access is required.

2.8 PHASING:

- A. Contractor will address phasing needs of utility work, integration with the existing facility, and return of construction site to Owner. Significant pre-planning with owner approval will be required to properly coordinate the work. Cost and schedule impacts should be anticipated to provide the pre-planning work.

2.9 SAFE ENVIRONMENT:

- A. Contractor is to secure site to protect the general public, staff and clients of the facility. The Contractor will be required to maintain the adequate protective measures around the site.

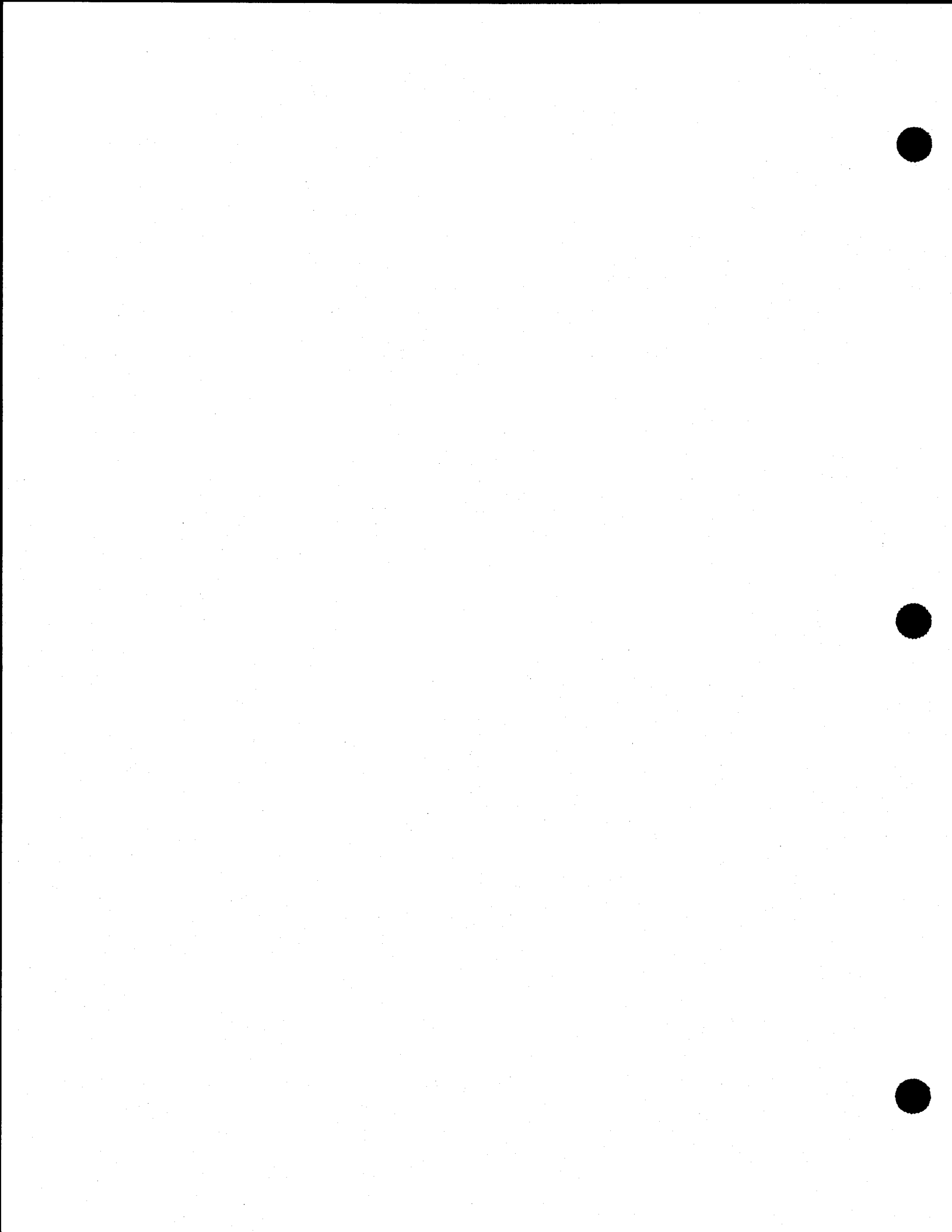
2.10 DEPARTMENT:

- A. The Contractor and all of the Contractor's employees and Subcontractors and their employees shall conduct themselves in a professional manner, avoid using profanity, playing loud music and shall be fully clothed while on the work site. The contractor may be requested to remove employees who refuse to comply.

2.11 ENTRANCES:

- A. Contractor shall not impede existing vehicular or pedestrian entrances. Coordinate required traffic disruptions with Owner.

END OF SECTION



**SECTION 01 14 00
WORK RESTRICTIONS**

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED:

- A. General Contractor shall coordinate the Work of the subcontractors for the Project.
- B. Each subcontractor shall:
 - 1. Coordinate work of his own employees and suppliers.
 - 2. Expedite his work to assure compliance with schedules.
 - 3. Coordinate his Work with that of other subcontractors.
 - 4. Comply with orders and instruction of General Contractor.

1.2 RELATED REQUIREMENTS:

- A. General Conditions of the Contract: Authority and responsibilities of the Contractor and subcontractor.

1.3 CONSTRUCTION ORGANIZATION AND START-UP:

- A. General Contractor shall establish on-site lines of authority and communications:
 - 1. Attend pre-construction meeting and progress meetings.
 - 2. Establish procedures for intra-project communications:
 - a. Submittals
 - b. Reports and records
 - c. Recommendations
 - d. Coordination drawings
 - e. Schedules (Critical path method, submitted to Architect within 30 days of Notice to Proceed)
 - f. Resolution of conflicts
 - 3. Interpret Contract Documents:
 - a. Consult with Architect to obtain interpretation.
 - b. Assist in resolution of questions or conflicts which may arise.
 - c. Transmit written interpretations to subcontractors, and to other concerned parties.
 - 4. Assist in obtaining permits and approvals:
 - a. Building permits and special permits required for Work or for temporary facilities.
 - b. Verify that subcontractors have obtained inspections for Work and for temporary facilities.
 - 5. Control the use of site:
 - a. Supervise field engineering and site layout.
 - b. Allocate space for each subcontractor's use for field offices, sheds, and work and storage areas.
 - c. Establish access, traffic and parking allocations and regulations. Monitor use of site during construction.

1.4 GENERAL DUTIES:

- A. Construction Schedules:
 - 1. Prepare a detailed schedule of basic operations for all subcontractors.

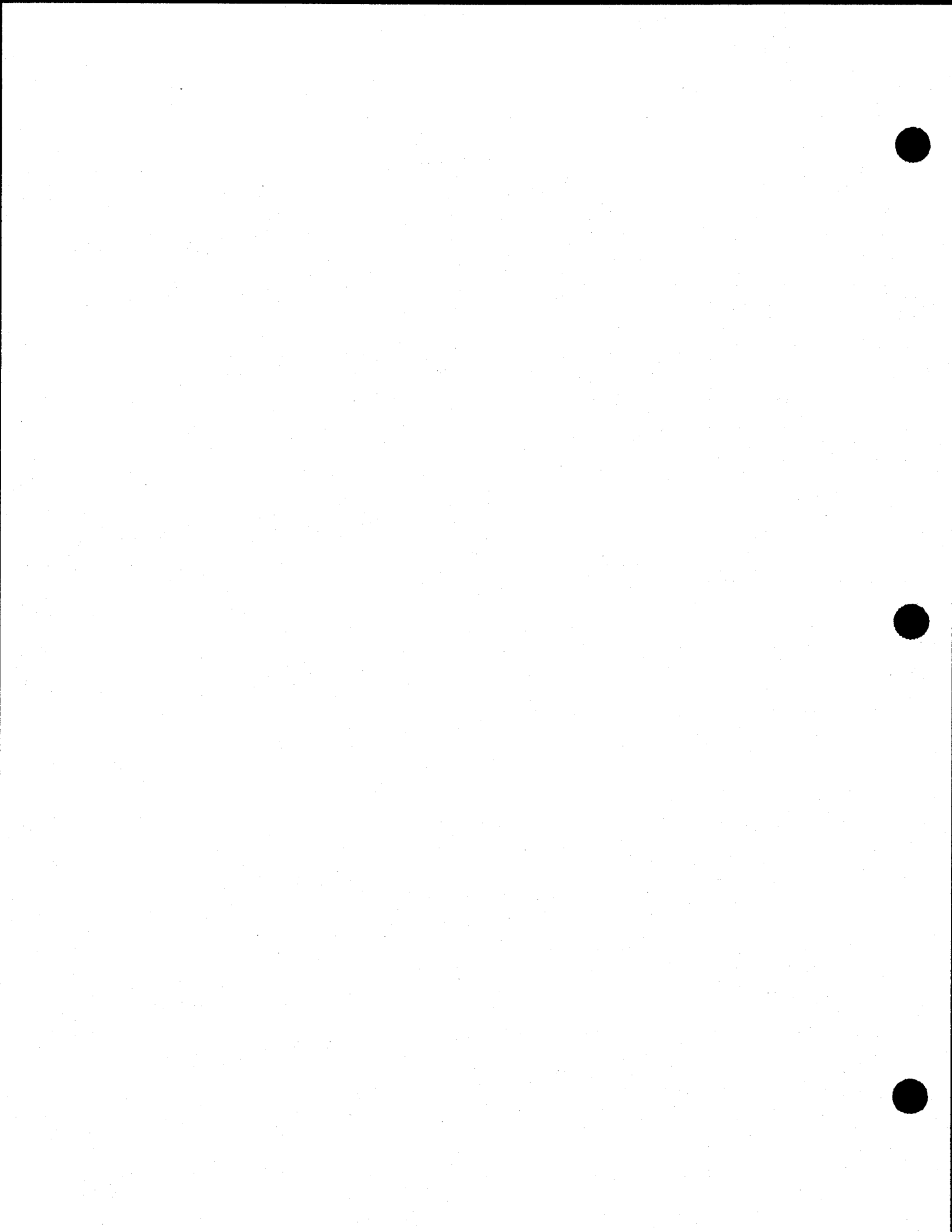
- a. Each subcontractor shall prepare sub-schedules to comply with critical phases.
- 2. Monitor schedules as work progresses:
 - a. Identify potential variances between scheduled and probable completion dates for each phase.
 - b. Recommend to Owner adjustments in schedule to meet required completion dates.
 - c. Adjust schedules of subcontractors as required.
 - d. Document changes in schedule, submit to Owner, Engineer and to involved subcontractors.
- 3. Observe Work of each subcontractor to monitor compliance with schedule.
 - a. Verify that labor and equipment are adequate for the Work and the schedule.
 - b. Verify that product procurement schedules are adequate.
 - c. Verify that product deliveries are adequate to maintain schedule.
 - d. Report noncompliance to Architect, with recommendation for changes.
- B. Process Shop Drawings, product data and samples:
 - 1. Prior to submittal to Architect, review for compliance with Contract Documents:
 - a. Field dimensions and clearance dimensions.
 - b. Relation to available space.
 - c. Relation to other contracts and to other trades.
 - d. Effect of any changes on the work of any other contracts or other trades.
- C. Review coordination drawings prepared by mechanical and electrical Contractors:
 - 1. Prior to submittal to Engineer, review for compliance with Contract Documents.
 - 2. Resolve conflicts and assure coordination of the Work of, or affected by, mechanical and electrical trades, or by special equipment requirements.
- D. Inspection and testing:
 - 1. Inspect Work to assure performance in accordance with requirements of Contract Documents.
 - 2. Bring to Engineer's attention the need of any special testing and inspections of suspect Work.
 - 3. Reject Work which does not comply with requirements of Contract Documents.
 - 4. Coordinate Testing Laboratory services:
 - a. Verify that required laboratory personnel are present.
 - b. Verify that tests are made in accordance with specified standards.
 - c. Review test reports for compliance with specified criteria.
 Recommend and administer any required retesting.
- E. Monitor the use of temporary utilities:
 - 1. Verify that adequate services are provided and maintained.
- F. Monitor contractors' periodic cleaning:
 - 1. Enforce compliance with Specifications.
 - 2. Resolve any conflicts.
- G. Arrange for delivery of Owner-furnished products:
 - 1. Inspect for condition at delivery.
 - 2. Turn over to appropriate subcontractor, obtain receipt.
- H. Changes and substitutions:
 - 1. Recommend necessary or desirable changes to Owner and to Engineer.
 - 2. Review subcontractor's requests for change and substitutions. Submit

- recommendations to Owner and to Engineer.
- 3. Assist Engineer in negotiating Change Orders.
- 4. Promptly notify all subcontractors of pending changes or substitutions.

1.5 CLOSE-OUT DUTIES:

- A. Mechanical and electrical equipment start-up:
 - 1. Coordinate check-out of utilities, operations systems and equipment.
 - 2. Assist in initial start-up and testing.
 - 3. Record dates of start of operation of systems and equipment.
 - 4. Submit to Owner written notice of beginning of warranty period for equipment put into service.
- B. At completion of Work of each Contract, conduct an inspection to assure that:
 - 1. Specified cleaning has been accomplished.
 - 2. Temporary facilities have been removed from site.
- C. Substantial Completion:
 - 1. Conduct an inspection to confirm or supplement subcontractor's list of work to be completed or corrected.
 - 2. Assist Engineer in preparation of correction list.
 - 3. Supervise correction and completion of Work as established in Certificate of Substantial Completion.
- D. When Owner occupies a portion of Project prior to final completion, coordinate established responsibilities of Contractor and Owner.
- E. Final Completion:
 - 1. When each subcontractor determines that Work is finally complete, conduct an inspection to verify completion of Work.
 - 2. Assist Engineer in verification of final completion.
- F. Administration of Contract Closeout:
 - 1. Receive and review subcontractor's final submittals.
 - 2. Transmit to Engineer with recommendations for action.

END OF SECTION



**SECTION 01 33 00
SUBMITTAL PROCEDURES**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Submittal procedures.
- B. Construction progress schedules.
- C. Proposed products list.
- D. Product data.
- E. Shop drawings.
- F. Samples.
- G. Design data.
- H. Test reports.
- I. Certificates.
- J. Manufacturer's instructions.
- K. Manufacturer's field reports.
- L. Erection drawings.
- M. Construction photographs.

1.2 SUBMITTAL PROCEDURES

- A. With each submittal, provide a transmittal with area provided for Architect/Engineer comments and / or acceptances.
- B. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.
- C. Identify Project, Contractor, subcontractor and supplier; pertinent drawing and detail number, and specification section number, appropriate to submittal.
- D. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.
- E. Schedule submittals to expedite Project, and deliver to Architect/Engineer at 1641 Commerce Street, Corona, California 92880. Coordinate submission of related items.
- F. For each submittal for review, allow 10 days excluding delivery time to and from Contractor.

- G. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of completed Work.
- H. Allow space on submittals for Contractor and Architect/Engineer review stamps.
- I. When revised for resubmission, identify changes made since previous submission.
- J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.
- K. Submittals not requested will not be recognized or processed.

1.3 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit initial schedules within 14 days after date established in Notice to Proceed. After review, resubmit required revised data within ten days.
- B. Submit revised Progress Schedules with each Application for Payment.
- C. Distribute copies of reviewed schedules to Project site file, subcontractors, suppliers, and other concerned parties.
- D. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.
- E. Submit computer generated Gantt chart with separate line for each major portion of Work or operation, identifying first work day of each week.
- F. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate early and late start, early and late finish, float dates, and duration.
- G. Indicate estimated percentage of completion for each item of Work at each submission.
- H. Submit separate schedule of submittal dates for shop drawings, product data, and samples, and dates reviewed submittals will be required from Architect/Engineer. Indicate decision dates for selection of finishes.
- I. Revisions To Schedules:
 - 1. Indicate progress of each activity to date of submittal, and projected completion date of each activity.
 - 2. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.
 - 3. Prepare narrative report to define problem areas, anticipated delays, and impact on Schedule. Report corrective action taken, or proposed, and its effect including effect of changes on schedules of separate contractors.

1.4 PROPOSED PRODUCTS LIST

- A. Within 14 days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.5 PRODUCT DATA

- A. Product Data: Submit to Architect/Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
- B. Submit number of copies Contractor requires, plus two copies Architect/Engineer will retain.
- C. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- D. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- E. After review, produce copies and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents described in Section 01 70 00 - Execution and Closeout Requirements.

1.6 SHOP DRAWINGS

- A. Shop Drawings: Submit to Architect/Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
- B. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. When required by individual specification sections, provide shop drawings signed and sealed by professional engineer responsible for designing components shown on shop drawings.
 - 1. Include signed and sealed calculations to support design.
 - 2. Submit drawings and calculations in form suitable for submission to and approval by authorities having jurisdiction.
 - 3. Make revisions and provide additional information when required by authorities having jurisdiction.
- D. After review, produce copies and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents described in Section 01 70 00 - Execution and Closeout Requirements.

1.7 SAMPLES

- A. Samples: Submit to Architect/Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
- B. Samples For Selection as Specified in Product Sections:
 - 1. Submit to Architect/Engineer for aesthetic, color, or finish selection.

2. Submit samples of finishes [from full range of manufacturers' standard colors,] [in custom colors selected,] textures, and patterns for Architect/Engineer selection.
- C. Submit samples to illustrate functional and aesthetic characteristics of Products, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
- D. Include identification on each sample, with full Project information.
- E. Submit number of samples specified in individual specification sections; Architect/Engineer will retain one sample.
- F. Reviewed samples which may be used in the Work are indicated in individual specification sections.
- G. Samples will not be used for testing purposes unless specifically stated in specification section.
- H. After review, produce duplicates and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents purposes described in Section 01 70 00 - Execution and Closeout Requirements.

1.8 DESIGN DATA

- A. Submit for Architect/Engineer's knowledge as contract administrator or for Owner.
- B. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.9 TEST REPORTS

- A. Submit for Architect/Engineer's knowledge as contract administrator or for Owner.
- B. Submit test reports for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.10 CERTIFICATES

- A. When specified in individual specification sections, submit certification by manufacturer, installation/application subcontractor, or Contractor to Architect/Engineer, in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Architect/Engineer.

1.11 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, [start-up,] adjusting, and finishing, to Architect/Engineer for delivery to Owner in quantities specified for Product Data.

- B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

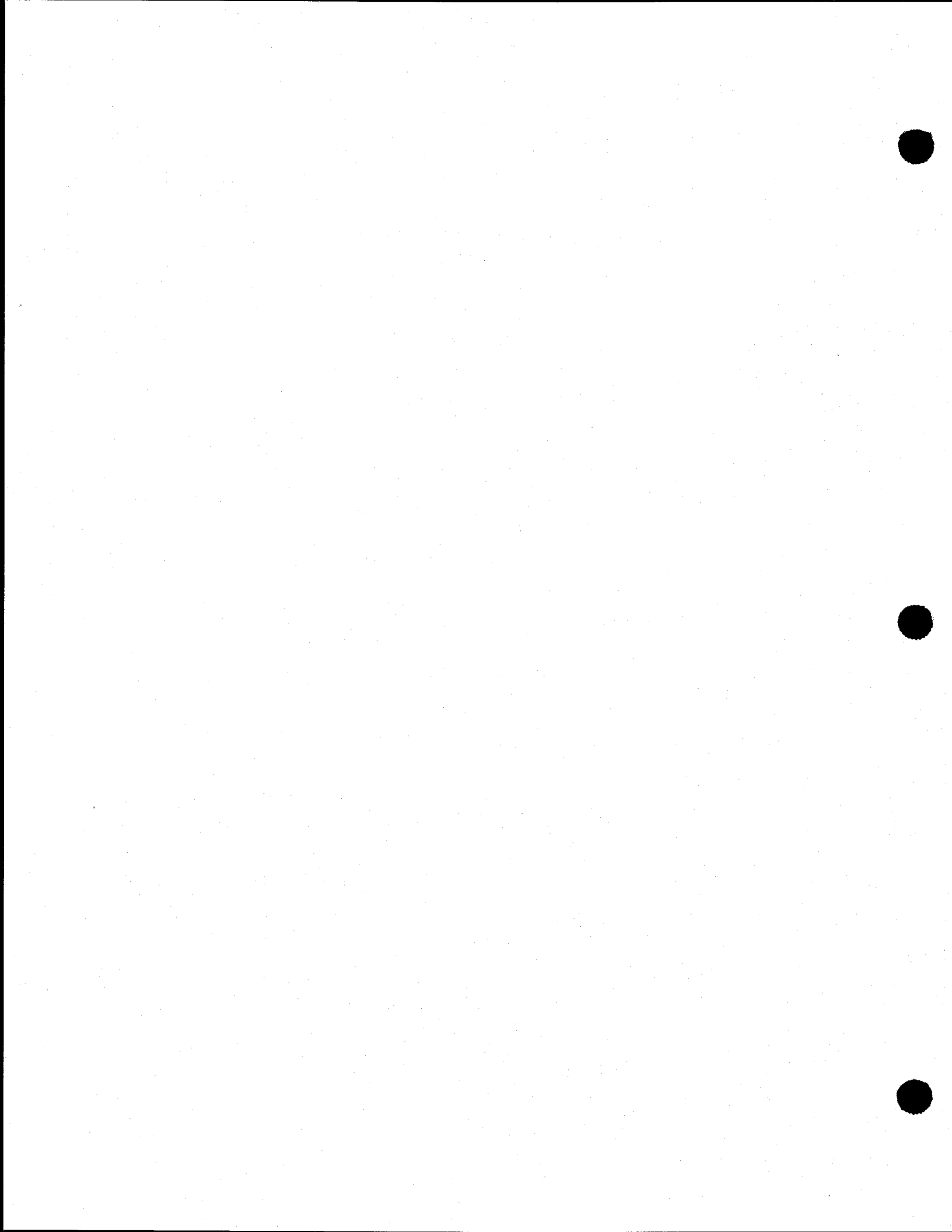
1.12 MANUFACTURER'S FIELD REPORTS

- A. Submit reports for Architect/Engineer's benefit as contract administrator or for Owner.
- B. Submit report in duplicate within 5 days of observation to Architect/Engineer for information.
- C. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.13 CONSTRUCTION PHOTOGRAPHS

- A. Provide photographs of site and construction throughout progress of Work.
- B. Submit photographs on an ongoing basis throughout the project.

END OF SECTION



**SECTION 01 60 00
PRODUCT REQUIREMENTS**

PART 1 - GENERAL

1.1 WORK INCLUDED:

- A. Whenever in the Specifications any material, article or process is indicated or specified by trade, patent, or proprietary name or name of manufacturer, such specification shall be deemed to be followed by the words, "Or equal, as approved in writing by the Engineer".
- B. Where more than one proprietary name is specified, the Contractor may provide materials or equipment of any one of the manufacturers specified, only if full compliance with other portions of the Specification can be provided.

Refer to "General Conditions", Page 14 of 44, Paragraph entitled 5.3, "Substitutions", referencing procedures for substitution requests, except as modified herein.

1.2 MATERIALS:

- A. Unless otherwise specifically provided in this Contract, all equipment, material, and articles incorporated into the Work of this Contract shall be new and suitable for the purpose intended.
- B. Reference to any equipment, material, article or patented process, by trade name, or catalog number shall not be construed as limiting competition. In those cases where the Specifications designate a material, product, thing or service by specific brand or trade name and there is only one brand or trade name listed, the item involved is:
 - 1. Required to be used since it is a unique or novel product application.
 - 2. Used as a standard of quality which must be satisfied without compromise.
 - 3. The only brand or trade name known to the Engineer.
- C. Construction shall be in compliance with the equivalent ICBO Report for the material specified.

1.3 SUBSTITUTIONS:

- A. Should the Contractor wish to substitute an item he considers equal to the one specified, he must within fifteen (15) days after the award of this Contract, furnish to the Engineer the name of the manufacturer, the model number, and other pertinent data and information respecting the "or equal" item which has been proposed in his bid and which the Contractor contemplates incorporating in the Work. If the "or equal" item is not founded by the Engineer to be in fact, equal or better, the Contractor shall furnish the item as set forth in the Specifications.
- B. When required by this Contract or when called for by the Engineer or Owner, the Contractor shall furnish full information concerning the material or articles which he contemplates incorporating in the Work. Testing of a proposed substitute material to assure compliance with the Specifications may be required by the Engineer or Owner at the Contractor's expense. When so directed, samples shall be submitted for approval. Equipment, material, and articles installed or used without required approval shall be at the risk of subsequent rejection.



**SECTION 01 70 00
EXECUTION AND CLOSEOUT REQUIREMENTS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Closeout procedures.
- B. Final cleaning.
- C. Protecting installed construction.
- D. Project record documents.
- E. Operation and maintenance manuals.

1.2 CLOSEOUT PROCEDURES

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Architect/Engineer's review.
- B. Provide submittals to Architect/Engineer required by authorities having jurisdiction.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

1.3 FINAL CLEANING

- A. Execute final cleaning prior to final project assessment.
- B. Clean site; sweep paved areas, rake clean landscaped surfaces.
- C. Remove waste and surplus materials, rubbish, and construction facilities from site.

1.4 PROTECTING INSTALLED CONSTRUCTION

- A. Protect installed Work and provide special protection where specified in individual specification sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- C. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- D. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- E. Prohibit traffic from landscaped areas.

1.5 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed Shop Drawings, Product Data, and Samples.
 - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress, not less than weekly.
- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates utilized.
 - 3. Changes made by Addenda and modifications.
- F. Record Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 2. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 3. Field changes of dimension and detail.
 - 4. Details not on original Contract drawings.
- G. Submit documents to Architect/Engineer with claim for final Application for Payment.

1.6 OPERATION AND MAINTENANCE MANUALS

- A. The County requires a minimum of (5) five bound sets of final installation, training, operation, maintenance, and repair manuals to be turned over to the Owner's representative and approved for content by the County prior to the acceptance of substantial completion.
- B. Style:
 - 1. All manuals shall be bound in white, hard cover, heavy three ring (D-ring) binders with clear view, presentation type, vinyl covers. Binders shall also contain front and back pockets. Maximum allowable spine width is two inches.
 - 2. No binder will be accepted that is filled to more than 80% of capacity. When necessary to submit multiple volume sets, each volume will be labeled numerically, using Roman numerals, in ascending order, beginning with number 1. The order of the volumes will follow the specification division numbers contained on the tabs inside each volume.
- C. Content:
 - 1. Manuals provided must be of sufficient detail as to enable County employees to install, calibrate, train, operate, maintain, service, and repair every system, subsystem, and piece of equipment installed on or as a part of any contract awarded by the County.
 - 2. What follows is a list of items, and their required formats, that must be included as a part of all submitted manuals.

- a. Binder Inserts - The Front cover insert shall be printed on high quality white, bonded paper and contain the following: County Logo, County Project Title, County Project number, Location, date of submittal, volume number name of Architect, name of Engineer, and the name of the County project management representative. The spinal insert will contain only the County Logo, County project Title, County project number, date of submittal and volume number. No insert will be placed in the back cover. To maintain uniformity, no other information will be accepted on these inserts.
- b. Index - The first page in each volume will be a master Index describing, by division numbers, the information contained in each volume. The page(s) immediately following the master index will be the volume table of contents containing the description and 5 digit division number of all information contained in that volume. All information will be indexed using the CSI master format 5 digit division numbers. Information will be divided by tabbed inserts with the 5 digit item numbers printed on the tabs.
- c. Other Information - The pages immediately following the table of contents in each volume will contain the following information in this order:
 - 1) Information sheet - Project title, project number, location, date of submittal, Architect (name, address, and telephone number), Engineer (name, address, and telephone number), Contractor (name, address, and telephone number), and all Sub-Contractors (name, address, and telephone number).
 - 2) Emergency Contact List - Names and telephone numbers of contact persons on warranty items. Any special instructions should also be included on this page.
 - 3) Inspections and Guarantees - Copies of all inspection, guarantee, and warranty certificates with the County of Riverside named as owner of all equipment and property.
 - 4) Valve Tag List - A record of all valves installed shall be made and shall include the following information: Valve tag number, location of valve, service area, type of service, type of valve, manufacturer, and model number.
 - 5) Finish Schedule - A copy of the interior and exterior finish plan schedule listing all finish materials, manufacturers, colors, paint numbers, and use & care instructions.

D. Equipment:

1. All equipment required by contract and/or installed by the contractors or sub-contractors must be accompanied by the original copies of its documentation. This documentation must be included in all four sets of manuals and at minimum include: Installation manuals, training manuals, service manuals, parts lists, shop drawings, calibration manuals (if applicable), operation manuals, repair manuals, and wire lists (if applicable). **Under no circumstances will catalog cut sheets be considered acceptable replacements for any of the above items.**
2. Documentation for each piece of equipment shall be indexed as mentioned above and be placed after the appropriate tab. Each tabbed section must contain, as its first sheet, a checklist of all documentation included in that section, location(s) of equipment, and vendor name and address. If more than one type of equipment falls under the same number, a checklist for each type must be present. If the binder includes manuals from any one vendor covering several model numbers, the model used must be highlighted.

E. Shop Drawings:

1. The maximum drawing size allowed in binders shall be folded 11" x 17". These drawings shall be hole punched, re-enforced, and placed with the appropriate information under the correct tab. Drawings placed in pockets of binder are not acceptable. Top of drawings shall be at the top or spine side of the manual. The complete drawing must be viewable without opening rings. All drawings not meeting these size requirements must be bound together, rolled, banded, and submitted (4 sets) along side manuals.

F. Test and Balance Report:

1. Copies of each system air balancing record and each system hydronic balancing record must accompany manuals submittal. As most such documents are produced using computers, one additional copy of the Test & Balance report should be submitted on a 3-½ inch diskette. (4 total sets).

1.7 AS-BUILT DRAWINGS:

A. Blueprints:

1. One set of blueprints with "As - Built" stamp shall be submitted upon Substantial Completion of project. These record sets should be complete and accurate. Record Sets of documents are to be continually maintained for the duration of the project, with regular recording of any changes made during construction. Record Sets shall be separate from daily working documents used in the field, and be available to County Inspector of Record (IOR), Project Manager, Design Engineer, Architect, or other Owner Representatives. All changes must be indicated before final submittal of these drawings. Once original "As-Built" is submitted, reviewed, and approved by Record Engineer, (4) copies of approved "As-Built" is to be reproduced and provided as part of close-out documentation, along with the original, for a total of (5) Record Drawings.

B. Reproduction Drawings:

1. One set of **reproducible** "As - Built" drawings shall be submitted for use by County Archives. These drawings will be used to produce new drawing sets to replace others as they become worn.

C. CAD Drawings:

1. As most drawings are made on CAD programs, one full set of "As - Built" drawings must be submitted on CD-ROM for official use in both the Facility and Maintenance Departments. Use the most recent and current AutoCAD format. The CD should also include any shop drawings available in this format or scanned documents. All information on documents must be clearly legible and readable. Questions regarding formats of documentation may be directed to the record engineer or to the County.

END OF SECTION

**SECTION 05 40 00
COLD-FORMED METAL FRAMING**

PART 1 - GENERAL

1.1 SUMMARY:

- A. Section Includes: Cold formed metal framing systems for load bearing walls and partitions.
- B. Related Documents: The Conditions of the Contract and Division 1 apply to this section as fully as if repeated herein.

1.2 RELATED WORK:

- A. Furring systems designed for mechanical attachment of semirigid insulation blankets to concrete or masonry walls are specified in Section 07 21 00.

1.3 REFERENCES:

- A. The editions referenced herein of specifications and standards published by the following organizations, apply only to the extent specified by the reference.

American Society for Testing and Materials (ASTM)
American Welding Society (AWS)
American Iron and Steel Institute (AISI)

1.4 DESIGN REQUIREMENTS:

- A. Where design of studs, joists, bracing and other framing members and connections are not indicated they shall be designed by a structural engineer registered in the State of California and employed by the Contractor. Design shall include fasteners, attachments and lateral bracing required for proper installation. Design shall conform to the following criteria:
 - 1. Exterior Wall Framing: Design exterior wall framing to withstand the wind loads and seismic loads specified in the California Building Code (CBC) Chapter 16, with deflection limited to L/360.
 - 2. Load Bearing Wall Framing: Design framing to provide structural properties indicated.
 - 3. Compute structural properties of studs, joists, bracing, and other framing members in accordance with AISI "Specifications for Design of Cold-Formed Steel Structural Members".

1.5 SUBMITTALS:

- A. Shop Drawings: Submit shop drawings for wall and partition framing systems and special assemblies where the design is not indicated. Show size, gage and cross sections and spacing of framing members; connections including welding procedures and electrodes; and supplemental strapping, bridging, lateral bracing, accessories, and details required for proper installation. Furnish layout of required clips or slots to the metal deck installer well in advance of deck installation.
- B. Product Data: Submit framing manufacturer's literature, including a current International Code Council Evaluation Service Reports (ICC ESR's), showing tabulation of structural properties, load

capacities, dimensions, metal gags and type of coating for all framing and furring members. Submit powder driven fastener manufacturer's current ICC ESR's

1. Submittal procedures and quantities are specified in Section 01340.

1.6 QUALITY ASSURANCE:

A. Qualification of Welding: Qualify welding procedures and welding operators in accordance with AWS D1.3 and the California Building Code. Provide certifications that welders to be employed in the construction have satisfactorily passed AWS qualification tests. If re-certification of welders is required, retesting will be the Contractor's responsibility

1. Regulatory Requirements: Furnish and install wall framing and powder driven fasteners in accordance with the framing and fastener manufacturer's current ICC ESR's.
2. Fire Rated Assemblies: Where framing units are components of assemblies indicated for a fire-resistance rating, including those required for compliance with the CBC Chapter 7 - Fire-Resistant Materials and Construction, provide units which are listed in the current UL "Fire Resistance Directory" and that have been approved by the local building official.
3. Pre-installation Conference: Before beginning installation of the metal framing systems, hold a conference with representatives of the installers of metal framing systems, door frames, plaster, gypsum board, mechanical and electrical construction, Contractor, and Architect in attendance. The conference shall assure a clear understanding of the drawings and specifications, resolve possible conflicts and establish coordination between all parties involved.

1.7 DELIVERY, STORAGE, AND HANDLING:

Deliver materials to the project site and store them in adequately ventilated dry locations. If it is necessary to store materials outside, stack them off the ground on a platform and fully protected from the weather.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. Available Manufacturers: Acceptable manufacturers or equal:

California Expanded Metal Products Co.; ICC ER - 3403P
Steel Stud Manufacturer's Association; ICC ER - 4943P

2.2 MATERIALS:

- A. Hot-dip Zinc Coated Steel: ASTM A 653, Grade SQ, 40,000 psi yield strength or greater for 14 and 16 gage studs and 33,000 psi yield strength for all other members. Framing shall have hot-dip zinc coating complying with designation G60.
- B. Carbon Steel: ASTM A 570, Grade 40, (40,000 psi) or greater for 14 and 16 gage studs and ASTM A 611, Grade C, (33,000 psi yield strength) for all other members. Provide framing components with electro-galvanized finish, conforming to ASTM A 633, Type RS or shop-applied red oxide, zinc chromate or other similar primer.
- C. Welding Electrodes: AWS A5.1 or A5.5, E 70.

- D. Powder Driven Fasteners: Types and sizes indicated on the drawings. Acceptable manufacturers or equal:

Hilti Corp.
ITW/Ramset/Red Head
- E. Screws: No. 8 by 3/8 inch cadmium or zinc coated TEKS screws with pan heads.
- F. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper.
- G. Concrete inserts, expansion anchors, powder driven fasteners, flange clips, and bolts for attachment of hanger wires to overhead construction shall have a rated capacity equal to that of the hanger wire.
- H. Galvanizing Repair Compound: High zinc dust content galvanizing repair paint meeting the requirements of ASTM A 780 or hot applied zinc rich material.
Acceptable products or equal:

American Solder & Flux; Drygalv
Kenco Div.; Galvicon
Metalloy Products Co.; Galvalloy

2.1 FRAMING COMPONENTS:

- A. Wall Framing Members: Fabricate studs and runners in accordance with ASTM C 955 from electrolytic zinc coated or prime coated steel, of thickness indicated. All studs shall be rolled from new steel sheet material and shall not be produced from re-rolled steel.
- B. Joists: Z-shaped joists with minimum 1-5/8 inch wide flat flanges and punched webs fabricated from electrolytic zinc coated or prime coated steel, of thickness indicated. All joists shall be rolled from new steel sheet material and shall not be produced from re-rolled steel.
- C. Bridging: Unpunched channel shaped members designed for use with the studs, formed from electrolytic zinc coated or prime coated steel, of thickness indicated.
- D. Strapping, Lateral Bracing, Clip Angles and other Accessories: Manufacturer's standard components formed from electrolytic zinc coated or prime coated steel.
- E. Backing Plates: Steel, 3/16 inch thick, of proper size to accommodate fastenings.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. General: Conform to rules and practices set forth in the CBC and AISI "Specifications for Design for Cold Formed Steel Structural Members," and with the manufacturer's printed instructions and recommendations, as applicable.
- B. Cut stock neat and square. Provide members free of kinks and twists. Do not use damaged or distorted materials.
- C. Erect straight, plumb, square, true to lines, levels or elevations indicated, free from excessive twists and bends and braced against racking.

- D. Runner Tracks: Furnish in 8 feet minimum lengths except where wall lengths are shorter than 8 feet. Make tracks continuous by splicing in accordance with the manufacturer's recommended details. Align runner tracks accurately to the partition layout at both base and tops of studs. Secure runner tracks as recommended by the stud manufacturer in ICC ESR's for the floor and ceiling construction involved. Provide fasteners at all corners and ends of runner tracks.
- E. Wall Studs: Provide studs in one piece, track to track, no splicing will be permitted. Install bridging as recommended by the framing manufacturer, except as otherwise indicated. Frame both sides of expansion and control joints with separate studs. Do not bridge the joint with components of stud system.
1. Secure studs to top and bottom runner tracks by either welding or screw fastening at both inside and outside flanges; wire tying of framing components will not be permitted.
 2. Install supplementary framing, blocking, and bracing in metal framing system wherever walls or partitions are indicated to support fixtures, equipment, services, casework, heavy trim and furnishings, and similar work requiring attachment to the wall or partition. Use backing plates of thickness specified herein and of proper size to accommodate fastenings.
 3. Frame wall openings larger than 2 feet square with double stud at each jamb of frame except where more than two are either indicated or recommended by the manufacturer. Install runner tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with stud shoes or by welding, and space jack studs same as full-height studs of wall.
- F. Joists: Provide joists with at least 1-1/2 inch bearing and reinforce over bearings where required to prevent web crippling. Splice joists over bearings only. Lap and weld splices as recommended by the manufacturer. Provide manufacturer's standard lateral bracing. Secure joists to interior support systems to prevent lateral movement of bottom flange.
1. Attach members together by either welding or screw fastening; wire tying of framing components will not be permitted.
- G. Welding shall conform with the latest edition of AWS D1.3. Undercut shall not exceed 0.01 inch. Welding operators shall be previously certified for the welding to be done.
- H. Touch up abrasions, burns, and welding, including construction activities of other trades, with primers for primed steel or with approved galvanizing compound if galvanized. Remove oil, grease, rust, loose scale, loose coatings, weld slag and other deleterious material before touch-up.

END OF SECTION

**SECTION 06 10 00
ROUGH CARPENTRY**

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. Provide wood, nails, bolts, screws, framing anchors and other rough hardware and their installation where shown on the drawings, as specified herein, and as needed for a complete and proper installation.
- B. Refer to General Notes on the Structural Drawings.

1.2 RELATED WORK:

- A. Related Work Specified Elsewhere:
 - 1. Section 06 20 00 - Finish Carpentry.
 - 2. Section 06 40 00 - Architectural Woodwork.

1.3 QUALITY ASSURANCE:

- A. Lumber Grading Rules and Wood Species to be in conformance with West Coast Lumberman's Association Standards.
- B. Grading rules of following associations apply to materials furnished under this section.
 - 1. West Coast Lumber Inspection Bureau (WCLIB).
 - 2. Western Wood Products Association (WWPA).
 - 3. Redwood Inspection Service (RIS).
 - 4. American Plywood Association (APA).
 - 5. Refer to the Structural Drawings for further applicable material grade rules.
- C. Plywood Grading Rules:
 - 1. Structural wood panels - APA Rated Construction and Industrial: PS 1-83 or as indicated on the Structural Drawings.
- D. Grade Marks:
 - 1. Identify lumber and plywood by official grade mark.
 - 2. Lumber:
 - a. Grade stamp to contain symbol of grading agency, mill number or name, grade of lumber, designation, and condition of seasoning at time of manufacturer.
 - b. S-Dry: Maximum 19% moisture content.
 - 3. Softwood Plywood:
 - a. Conform to PS 1-83 or as indicated on the Structural Drawings.
- E. Regulatory Requirements:
 - 1. In addition to complying with applicable codes and regulations, comply with pertinent recommendations contained in:
 - a. Preservative treated lumber and plywood: American Wood Preserves Bureau (AWPB), Quality Mark.
 - b. Span tables and working stresses: 1997 Uniform Building Code.
 - 2. Where requirements of pertinent codes and standards conflict with this

Specification, comply with the more stringent provisions.

F. Source Quality Control:

1. Tests: Materials for which physical characteristics have been stipulated shall have had such characteristics independently confirmed by laboratory tests employing industry recognized procedures. Both the laboratory performing the tests and the test methods employed will be subject to the approval of the Architect.

1.4 REFERENCES:

A. National Bureau of Standards:

1. Product Standard PS-20: American Softwood Lumber Standard.
2. Product Standard PS-1: Softwood Plywood/Construction and Industrial.

B. California Building Code and Standards.

1.5 DELIVERY, STORAGE AND HANDLING:

- A. Immediately upon delivery to job site, place materials in area protected from weather.
- B. Store materials a minimum of six inch above ground on framework or blocking and cover with protective waterproof covering providing for adequate air circulation or ventilation.
- C. Do not store seasoned materials in wet or damp portions of building.
- D. Protect sheet materials from breaking corners and damaging surfaces while unloading.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Lumber:

1. Dimensions:

- a. Specified lumber dimensions are nominal.
- b. Actual dimensions to conform to PS 20.

2. Surfacing: Surface four sides (S4S), unless specified otherwise.

3. Species: Douglas Fir Larch.

- a. Concealed vertical and miscellaneous framing including plates, studs, blocking, bracing and nailers: Standard and Better.

i. Lumber in contact with concrete and exposed to weather shall be preservative treated as required by Title 24 CCR.

ii. Refer to Structural Drawings for grades, sizes and requirements.

B. Structural Wood Panels: Where grade and Identification Index are not otherwise shown on the Structural Drawings, comply with the following:

1. Roof Sheathing: C-C Grade, exterior type.

- a. Where diaphragm construction is shown, provide the following using species group required to meet the Identification Index requirements for roof frame spacing and thickness of plywood shown.

i. Structural I (exterior glue).

ii. Wall Sheathing: C-C Grade, exterior.

- a. Where shear wall construction is shown, provide the following, using species group required to meet the Identification Index requirements for stud frame spacing and thickness of plywood.

- i. Structural I (exterior glue).
 - ii. Exterior Graded Structural Wood Panels: Where edge or surface is permanently exposed to weather.
- C. Rough Hardware: Commercial grade, galvanized when exposed to exterior.
 - 1. Bolts: FS FF-B-575.
 - 2. Nuts: FS FF-N-836.
 - 3. Lag screws and bolts: FS FF-B-561.
 - 4. Toggle bolts: FS FF-B-588.
 - 5. Wood screws: FS FF-S-111.
 - 6. Metal cross bridging, 16 ga. zinc-coated steel.
 - 7. Bar or strap anchors: ASTM A 525, zinc coated steel, as detailed.
- D. High-density urea-bonded particleboard panels for use as a finish flooring material: Georgia-Pacific Novaply Special Panels consisting of three-layer, high density panels with square edges. Install over plywood sub-flooring in locations as denoted on the Drawings.
- E. Adhesive: APA Spec. AFG-01.

PART 3 - EXECUTION

3.1 INSPECTION:

- A. Verify that surfaces to receive rough carpentry materials are prepared to required grades and dimensions.

3.2 INSTALLATION:

A. General:

- 1. Provide framing members of sizes and on spacings shown, and frame openings as shown, or if not shown, comply with the recommendations of the Conventional Construction Provisions. Cut, join and tightly fit framing around other work. Do not splice structural members between supports unless otherwise detailed.

B. Sills:

- 1. Secure sills with 5/8 inch diameter by 12 inches long minimum size anchor bolts embedded minimum 7" into footing below 6" slab, cold joint if used, spaced maximum of four feet as per or as scheduled or indicated on the Structural Drawings.
- 2. Provide minimum of two anchor bolts per piece and maximum of nine inches from ends or as indicated on the Structural Drawing.
- 3. Any anchor bolt not founded correctly, or was not placed as indicated on the Structural Drawings which require shot pins, red heads, (subject use to be approved by the Structural Engineer), will require 50% pull-out requirement. Cost of testing will be paid for by the Contractor at no additional cost to the Owner. The design pull-out strength will be as calculated (to each specified condition) at time of occurrence.

C. Posts or Columns:

- 1. Align surfaces on posts flush with wall surface for installation of interior finish materials.

2. Built-up posts: Arrange and nailed together to accommodate type of construction.
3. Erect posts straight, plumb with straight edge and level, and brace with tack boards at plate and sill.

D. Stud Framing:

1. Plates and Stud Members:
 - a. Provide single bottom plate and double top plates for load bearing partitions, two inches thick by width of studs.
 - b. Provide studs in continuous lengths without splices.
 - c. Toenail or end nail studs to bottom plate and end nail to lower top plate.
 - d. Face nail upper top plate to lower top plate.
 - e. Nail bottom plate to wood construction with specified sill nailing.
 - f. Anchor bottom plate to concrete structure with anchor bolts. Expansion bolts will not be allowed at bearing partitions unless otherwise indicated on the Structural Drawings.
 - g. Triple studs at corners and partition intersections.
 - h. Anchor studs abutting masonry or concrete with 1/2 inch anchor bolts, maximum spacing of four feet on-centers, or as detailed.
 - i. Frame Openings: Provide double or triple studs and headers at openings as detailed.
2. Headers:
 - a. Continuous headers, same width as studs, depth required to span widest opening.
 - b. Toenail headers to studs and opening framing or provide hangers as detailed.
3. Wall Bracing for Temporary Use:
 - a. Run bracing member diagonally at approximately 45 degree angle. Wall bracing may be removed after installation of wall/roof sheathing.

E. Joist Framing:

1. Install with crown edges up.
2. Support ends of each member minimum 1-1/2 inch of bearing on wood, or as indicated on the Structural Drawings.
3. Support joists at ends with solid blocking, two inches nominal thick by depth of joists, between members crossing bearing points.
4. Solid bridging: Nominal depth-to-thickness ratio of joists exceeding six, install bridging at eight feet intervals or as indicated on the Structural Drawings.
 - a. Size: Two inches by depth of joist.
 - b. Install offset to permit toe-nailing or end nailing.
 - c. Space bridging maximum:
 - i. Spans to 10 feet - one row midspan.
 - ii. Spans 10 feet to 20 feet - two rows at 1/3 span.
 - iii. Spans over 20 feet - rows not over eight feet apart.
 - iv. All space bridging maximum subject to what is specified on the Structural Drawings.

F. Rafters:

1. Double rafters at opening in roof framing to provide headers and trimmers, and

- support with metal hangers.
2. At ridge, place rafters directly opposite each other and nail to ridge member or support with metal hangers.
 3. At hips, bevel ends of rafters for bearing against hip rafters.
- G. Wall Sheathing: Structural Wood Panels.
1. Install with face grain vertical unless otherwise indicated on the Structural Drawings.
 2. Allow minimum 1/16 inch space at end joints and 1/8 inch at edge joints.
 3. Refer to Structural Drawings for nailing requirements.
 4. Opening in Stud Partitions: Frame all openings in stud partitions with headers or beams as shown or noted on the drawings; provide full bearing at ends of headers or beams as detailed on the Structural Drawings. Install sheathing from floor to roof sheathing and around all openings.
- H. Pressure-Treated Wood Products:
1. Provide pressure-treated wood or foundation grade redwood for all framing, blocking, furring, nailing strips built into exterior concrete or masonry walls, wood in contact with concrete and in conjunction with any foam stop nailers or polyurethane roofing. Pressure treated Douglas Fir shall be No. 2 minimum and bear the inspection agency quality mark.
 2. Apply two brush coats of copper Nafthenate solution to all sawed or cut surfaces of treated lumber.
- I. Miscellaneous Framing:
1. Fire Blocks and Draft Stops:
 - a. Fireblocking and draftstopping shall comply with C.B.C. Section 708. Provide to cut off all concealed draft openings (both vertical and horizontal) and form an effective barrier between floors, between a top story and a roof or attic space, concealed roof spaces and floor-ceiling assemblies.
 - b. Provide fireblocking in concealed spaces of stud walls and partitions, including furred spaces, at the ceiling and floor levels and at 10 foot intervals both vertical and horizontal. Provide at all interconnections between vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings. Fireblocking shall consist of 2 inches nominal lumber or other approved materials.
 - c. Provide draftstopping in attics, mansards, overhangs, false fronts set out from walls and similar concealed spaces of buildings so that the area between draft stops does not exceed 3,000 square feet and the greatest horizontal dimension does not exceed 60 feet. Where approved automatic sprinklers are installed, the area between draft stops may be 9,000 square feet and the greatest horizontal dimension may be 100 feet. Draftstopping shall consist of 1/2 inch gypsum board, 3/8 inch wood structural panel, 3/8 inch Type 2-M partical board or other approved materials adequately supported.
 2. Blocking:
 - a. Install in continuous horizontal row at mid-height of single story partitions over eight feet high and multi-story partitions.
 - b. Locate 2 inch nominal solid wood backing to facilitate installation of finishing materials, fixtures, specialty items, and trim.
 3. Framing for Mechanical Work:

- a. Frame members for passage of pipes and ducts to avoid cutting structural members.
 - b. Do not cut, notch, or bore framing members for passage of pipes or conduits without concurrence of Engineer. Reinforce framing members where damaged by cutting.
4. Plaster Reliefs: Block out with shaped solid blocking as required to create base for cement plaster decorative forms.
 5. Wood and Plywood Crickets or Cants: Install crickets or cant strips (except cane fiber max. 3-1/2 inch x 3-1/2 inch -- Standard 45 degrees) cant strips as detailed or noted.
 6. Rough Hardware: Install all rough hardware and miscellaneous metal necessary for proper completion of the rough carpentry.
 7. Cutting and Patching: Do all patching, major cutting and boring required for this work or the work of other trades. Minor cutting and boring of the structural carpentry for installation plumbing, mechanical, electrical or other work will be done by each trade.
 8. Cutting and Boring: Cutting of wood girders, beams or joist is limited to cuts and bored holes as detailed on the drawings, and Title 24.
 9. Washers: Install washers under heads and nuts of all bolts and lag screws bearing on wood; use malleable iron washers at redwood mudsills, plate washers elsewhere.
 10. Ceiling Framing: Set all roof and ceiling framing members with crown up, install in accordance with drawings.
 11. Framing for Piping: Provide required clearance for plumbing, heating and vent piping. No pipe exceeding one and one-half inches (1-1/2") outside diameter will be permitted in bearing or shear walls, unless approved reinforcement is specifically provided. Install pipes one and one-half inches (1-1/2") or less outside diameter in the center of plates using a neatly bored hole; no notching will be permitted, minimum plate width for piping six inches (6") nominal. Provide all furring required to accommodate ducts, piping, recessed panelboards, etc. Holes shall not exceed one third the width of the framing member.
 12. End Bearing: Cut joists, roof beams, girders and rafters to provide full, even, horizontal seating of member over support unless specifically detailed or shown otherwise.
 13. Sheathing Felt: Apply sheathing felt as required for installation of this work; nail with large-headed roofing nails in sufficient quantity to ensure a smooth neat installation without wrinkles, buckles or torn sheets.
 14. Nailing Strips and Backing: Install nailing strips, furring, joist studs, blocking or backing as detailed or required for finish material application.
 15. Hollow Metal Frames: Install all metal frames level, square and plumb; anchor frames securely in accordance with approved shop drawings; and as required to prevent distortion of displacement of any kind; exterior door frames set two inches (2") in concrete.
 16. Machine Applied Nailing: Use of machine nailing is subject to a satisfactory jobsite demonstration for each project and the approval by the project Architect or Structural Engineer and the Division of the State Architect. The approval is subject to continued satisfactory performance. Machine nailing will not be approved in 5/16 inch plywood. If nailheads penetrate the outer ply more than would be normal for a hand hammer or if minimum allowable edge distances are not maintained the

performance will be deemed unsatisfactory.

- a. 3/8 inch minimum edge distance.
 - b. Remove all shiners.
 - c. No crushing of wood due to overdriving permitted.
 - d. Hand nail underdriven nails.
17. Equipment Platform: Provide framed level platforms or curbs for mechanical equipment as required. See mechanical drawings for size and location.
 18. Pipe Supports: Provide roof top pipe supports as required. See mechanical and plumbing drawings for size and location.
 19. Shimming: Shim all areas that are scheduled to receive finishes to provide a perfectly level base for the application of those finishes. Cut shims from 2x material as required at walls and/or ceilings, etc., apply shims at 16 inches o.c. maximum and at all corners and edges.

END OF SECTION



**SECTION 06 20 00
FINISH CARPENTRY**

PART 1 - GENERAL

1.1 SUMMARY

- A. Install wood trim and other items not specifically described as being installed under other Sections of these Specifications.

1.2 RELATED WORK:

- A. Related Work Specified Elsewhere:
 - 1. Documents affecting Work of this Section include, but are not necessarily limited to General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
 - 2. Section 06100 - Rough carpentry.

1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen thoroughly trained and experienced in the necessary crafts and completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.

PART 2 - PRODUCTS

(No products are required in this Section)

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 WORKMANSHIP

- A. Produce joints which are true, tight, and well nailed with all members assembled in accordance with the Drawings.
- B. Jointing and fastening:
 - 1. Make joints to conceal shrinkage; miter exterior joints; cope interior joints; miter or scarf end-to-end joints.
 - 2. Install trim in pieces as long as possible, jointing only where solid support is obtained.
 - 3. Install items straight, true, level, plumb, and firmly anchored in place.
 - 4. Where blocking or backing is required, coordinate as necessary with other trades to ensure placement of required backing and blocking in a timely manner.
 - 5. Nail trim with finish nails of proper dimension to hold the member firmly in place without splitting the wood.
 - 6. Nail exterior trim with galvanized nails, making joints to exclude water and setting in waterproof glue or the sealant described in Section 07900 of these Specifications.

7. On exposed work, set nails for putty.
8. Screw, do not drive, wood screws; except that screws may be started by driving and then screwed home.

3.3 INSTALLATION OF OTHER ITEMS

- A. Install items in strict accordance with the Drawings, and the recommended methods of the manufacturer as approved by the Architect, anchoring firmly into position at the prescribed location, straight, plumb, and level.

3.4 FINISHING

- A. Sandpaper finished wood surfaces thoroughly as required to produce a uniformly smooth surface, always sanding in the direction of the grain; except do not sand wood which is designed to be left rough.
- B. No coarse grained sandpaper mark, hammer mark, or other imperfection will be accepted.

3.5 CLEANING UP

- A. Keep the premises in a neat, safe, and orderly condition at all times during execution of this portion of the Work, free from accumulation of sawdust, cut-ends, and debris.
- B. Sweeping:
 1. At the end of each working day, and more often if necessary, thoroughly sweep surfaces where refuse from this portion of the Work has settled.
 2. Remove the refuse to the area of the job site set aside for its storage.
 3. Upon completion of this portion of the Work, thoroughly broom clean all surfaces.

END OF SECTION

SECTION 06 40 00
ARCHITECTURAL WOODWORK

PART 1 – GENERAL

1.1 DESCRIPTION:

- A. Provide conventional casework under the classification of Architectural Woodwork where shown on the drawings, as specified herein, and as needed for a complete and proper installation.

1.2 RELATED WORK:

- A. Related Work Specified Elsewhere:
 - 1. Documents affecting Work of this Section include, but are not necessarily limited to General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
 - 2. Section 06 20 00 - Finish Carpentry.
 - 3. Section 07 90 00 - Joint Sealers.

1.3 QUALITY ASSURANCE:

- A. Regulatory Requirements:
 - 1. Comply with applicable codes and regulations of governmental agencies having jurisdiction.
 - 2. Where requirements of applicable codes, regulations and standards conflict with this Specification, comply with the more stringent provisions.
- B. Standards and Certification:
 - 1. All millwork shall be manufactured and installed in accordance with the standards in the latest edition of the Manual of Millwork of the Woodwork Institute of California in the grade specified, unless more stringent requirements are described in specification or on the drawings.
 - a. All specified millwork shall refer to W.I.C. Section 15 Plastic Covered Casework - W.I.C. Custom Grade, Construction Style Type I - Style A Frameless. (Class "A" materials 0-25 flame spread and no greater than 450 smoke density in one hour corridors, where occurs.)
 - b. Before delivery to the job site, the millwork supplier shall issue a W.I.C. Certified Compliance Certificates indicating the millwork products fully meet all the W.I.C. requirements of the grade specified. The first page of the shop drawings shall bear the W.I.C. Certified Compliance Label indicating that drawings fully meet the W.I.C. requirements. Each elevation of casework shall bear the W.I.C. Certified Compliance Label. Each plastic laminate countertop shall bear the W.I.C. Certified Compliance Label. Upon completion of the installation, a W.I.C. Compliance Certificate shall be issued for the installation.

1.4 SUBMITTALS:

- A. Product Data - Submit complete manufacturer's descriptive literature and specifications in accordance with the provisions of Section 01 33 00.

1. Materials List - Submit complete lists of materials proposed for use, giving the manufacturer's name, catalog number, and catalog cut for each item where applicable.
 2. Manufacturer's Recommendations - Submit the manufacturer's current recommended methods of installation, including relevant limitations and environmental cautions.
- B. Shop Drawings - In accordance with the provisions of Section 01 33 00, submit complete Shop Drawings comprehensively describing fabrication and installation of all assemblies. Shop Drawings submitted shall include not less than the following:
1. Interior miscellaneous millwork.
 2. Casework: Plastic covered casework, conforming to W.I.C. Sections 1 and 15.
- C. Samples - In accordance with the provisions of Section 01 33 00, submit the manufacturer's standard color and finishes palette, for selection.
1. Hardwoods, for color and grain selection.
 2. Laminated plastic, for color selection.
- 1.5 DELIVERY, STORAGE AND HANDLING:
- A. Delivery - Do not deliver millwork until building is in proper condition and arrangements are made to properly handle and store at job site. All plaster work and concrete work shall be dry, and the area receiving the millwork broom clean.
 - B. Storage - Store millwork in sheltered location and protect from rain, fog, and dew until installed in place. Keep millwork dry, loosely stacked and raised above floors and earth. The millwork shall not be subject to abnormal heat, extreme dryness, humid conditions, sudden changes in temperature, or direct sunlight. The Architectural millwork shall be acclimated to building temperatures 72 hours prior to installation.

PART 2 – PRODUCTS

2.1 MATERIALS:

- A. Laminated Plastic Counter Tops:
 1. W.I.C. Grade - Custom.
 2. Edge Covering - Self-edged.
 3. Color and Pattern - As selected by Interior Designer.
- C. Hardware:
 1. Adjustable Shelf Supports: K & V 255 Heavy duty type with D & V 256 shelf clips.
 2. Other miscellaneous hardware as required for a complete project and as recommended by W.I.C. Manual.
 3. Provide a 2-1/2" diameter hole with secure grommet in countertops where desktop computers and telephones are located. Coordinate with electrical drawings for locations.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. Millwork/Architectural Woodwork: Install complete after wood primers are applied and

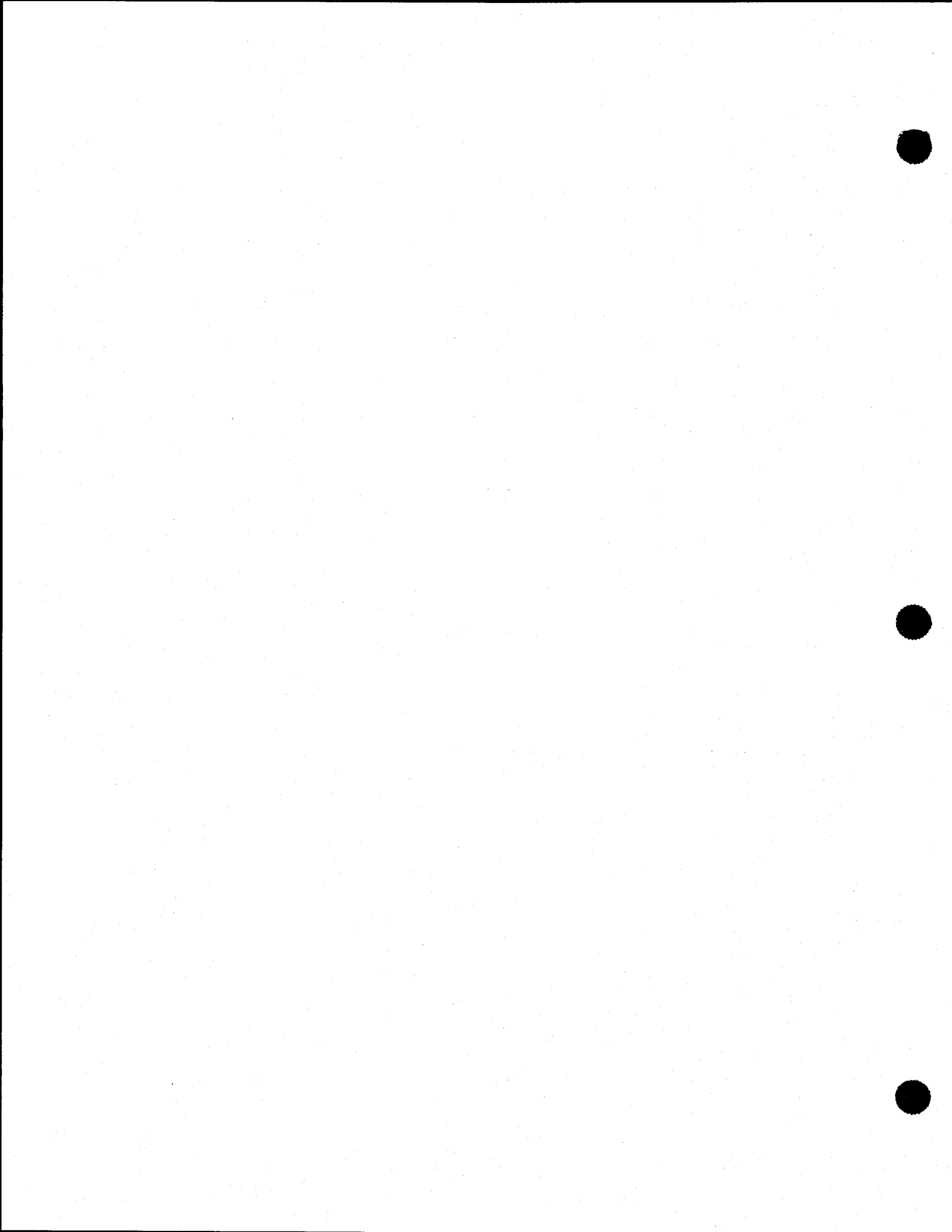
dry. Sandpaper to ease sharp edges and smooth rough areas caused by installation or to make joints flush.

- B. Trim - Install in as long lengths as possible with running joints mitered and fitted tight. Miter exterior corners. Color and laminate plastic finish same color as face of cabinet.
- C. Shelving - The minimum length of adjustable shelves shall be 1/16" less than the inside dimension of the cabinet. Shelves 1 inch to 29 inches long shall be 3/4" thick. Shelves 30 inches to 48 inches long shall be 1" thick. All exposed shelving in the same room shall be the same thickness, typical.

3.2 ADJUSTING AND CLEANING:

- A. Upon completion of work, remove surplus material, rubbish and debris, and leave job site broom clean. All cabinets shall be cleaned free of sawdust and pencil marks.
- D. All extra hardware or other miscellaneous pieces of suitable sizes shall be given to the District.
- E. Provide one tube of filler putty to Owner for each plastic laminate color used.

END OF SECTION



**SECTION 07 21 00
BUILDING INSULATION**

PART 1 – GENERAL

1.1 DESCRIPTION:

- A. Provide thermal and acoustical insulation where shown on the drawings, as specified herein, and as needed for a complete and proper installation.

1.2 RELATED WORK:

A. Related Work Specified Elsewhere:

- 1. Documents affecting Work of this Section include, but are not necessarily limited to General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
- 2. Section 06 10 00 - Rough Carpentry.
- 3. Section 09 25 00 - Gypsum Board.

1.3 QUALITY ASSURANCE:

- A. For purposes of designating type and quality for Work in this section, drawings and specifications are based on Johns Manville Building Insulation Division, 717 17th Street, P.O. Box 5108, Denver CO 80217-5108 Tel. (800) 654-3103).
- B. When substitute products are to be considered, supporting technical literature, samples and drawings must be submitted in accordance with Section 01630. Test reports certified by an independent testing laboratory must be made available upon request.
- C. Use adequate numbers of skilled workmen thoroughly trained and experienced in the necessary crafts and completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.

1.4 REGULATORY REQUIREMENTS:

- A. Comply with applicable codes and regulations of governmental agencies having jurisdiction including those having jurisdiction over noise control and energy conservation.
- B. Where requirements of applicable codes, regulations and standards conflict with the requirements of this Specification, comply with the more stringent provisions.
- C. Source Quality Control:
 - 1. Tests: Materials for which physical characteristics have been stipulated shall have had such characteristics independently confirmed by laboratory tests employing industry-recognized procedures. Both the laboratory performing the tests and the test methods employed will be subject to the approval of the Architect.

1.5 SUBMITTALS:

- A. Product Data: Submit complete manufacturer's description literature specifications and catalog cuts in accordance with the provisions of Section 01 33 00.
 - 1. Materials List: Submit complete lists of materials proposed for use, giving the manufacturer's name, catalog number, and catalog cut for each item where applicable.
 - 2. Manufacturer's Recommendations: Submit the manufacturer's current recommended methods of installation.

- B. Samples: In accordance with Section 013 33 00, submit samples of each insulation material clearly identified with manufacturer's name, brand name, R-value and composition.
- C. Test Reports: When and as directed by the Architect, submit certified laboratory test reports confirming physical characteristics of materials used in the performance of the Work of this Section.
- D. Certification: Upon completion of installation of building envelope insulation, a card certifying compliance with requirements of Title 24 for installation of insulation shall be completed, executed and delivered to local building officials, and one copy conspicuously posted at the site of the Work.

1.6 DELIVERY, STORAGE AND HANDLING:

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation.
 - 1. Deliver materials to project site in manufacturer' original packaging.
 - 2. Clearly identify manufacturer, contents, brand name, applicable standard, and R-value.
 - 3. Store materials off ground.
 - 4. Immediately remove damaged material from site.
- B. Replacements: In the event of damage, immediately make repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

1.7 SCHEDULING:

- A. Coordinate installation with other trades whose work may be affected.
- B. Do not install insulation until construction has progressed to the point that inclement weather will not damage or wet the insulation material.
- C. Install wall insulation after electric wiring, plumbing and other concealed work is in place.
- D. Install insulation between roof trusses at bottom of roof sheathing prior to installation of electrical conduit, wiring, fire sprinklers and/or mechanical ductwork. Modify and create openings thru thermal membrane as directed and as required by other trades.
- E. Insulation shall not be closed in until it has been inspected and approved.

PART 2 – PRODUCTS

2.1 MANUFACTURER:

- A. Owens-Corning, Manville, or approved equal.

2.2 MATERIALS:

- A. Exterior Walls - As noted on Drawings.
- B. Ceiling - As noted on Drawings.
- C. Interior Walls - As noted on Drawings.
- D. Acoustical Insulation – 5 " thick un-faced Fiberglas Batts. Owens-Corning "Sonobatts" or equal if applicable.

PART 3 – EXECUTION

3.1 INSPECTION:

- A. Prior to commencing the Work of this Section, carefully inspect previously installed work and verify that such work is complete to the point where this installation may properly commence.
- B. Verify that Work of this Section may be installed in accordance with applicable codes, regulations and standards, the Contract Documents and the approved submittals.

3.2 PREPARATION:

- A. Remove or protect against projections in construction framing that may damage insulation or prevent proper installation.

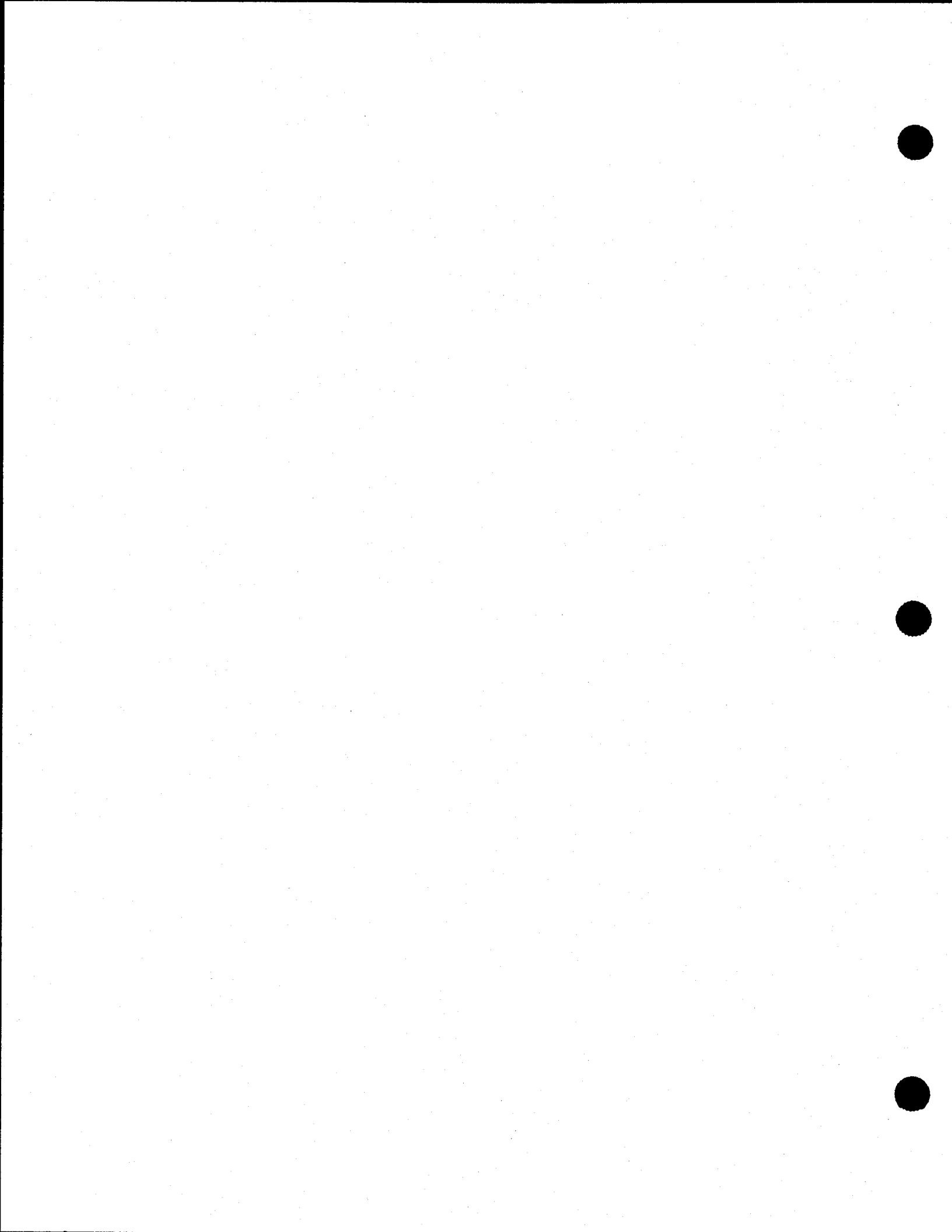
3.3 INSTALLATION:

- A. Install as per manufacturers written instruction.

3.4 ADJUSTING AND CLEANING:

- A. Remove and dispose of excess materials, litter, and debris leaving work areas in a clean condition.

END OF SECTION



**SECTION 07 90 00
JOINT SEALANTS**

PART 1 – GENERAL

1.1 DESCRIPTION:

- A. Provide interior and exterior caulking and sealing where shown on the drawings, as specified herein, and as needed for a complete and proper installation.

1.2 WORK INCLUDED:

- A. Work includes interior and exterior caulking and sealing, in not less than the following circumstances:
 - 1. Wherever expansion and contraction occurs and where noted on the plans.
 - 2. Between materials and products where infiltration of moisture, water, light or air blown particles may occur.
 - 3. Between materials and products in, or penetrating sound insulated walls, partitions and related construction.
 - 4. The terms sealant and caulking shall be considered interchangeable.

1.3 RELATED WORK:

- A. Related Work Specified Elsewhere:
 - 1. Documents affecting Work of this Section include, but are not necessarily limited to General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.4 QUALITY ASSURANCE:

- A. Regulatory Requirements:
 - 1. Comply with applicable codes and regulations of governmental agencies having jurisdiction.
 - 2. Where provisions of applicable codes, regulations and standards conflict with the requirements of this Specification, comply with the more stringent provisions.
- B. Source Quality:
 - 1. Tests: Materials for which physical characteristics have been stipulated shall have had such characteristics independently confirmed by laboratory tests employing industry-recognized procedures. Both the laboratory performing the tests and the test methods employed will be subject to the approval of the Architect.

1.5 SUBMITTALS:

- A. Product Data: Submit complete manufacturer's description literature and specifications in accordance with the provisions of Section 01 33 00.
 - 1. Materials List: Submit complete lists of materials proposed for use, giving the manufacturer's name, catalog number, and catalog cut for each item where applicable.

2. **Manufacturer's Recommendations:** Submit the manufacturer's current recommended methods of installation, including relevant limitations, and safety and environmental cautions.
- B. **Samples:** In accordance with the provisions of Section 01 33 00, submit samples of each color of sealant required.
- C. **Test Reports:** When and as directed by the Architect, submit certified laboratory test reports confirming physical characteristics of materials used in the performance of the Work of this Section.

1.6 DELIVERY, STORAGE AND HANDLING:

- A. **Protection:** Use all means necessary to protect the materials of this Section before, during and after installation.
 1. Deliver materials in original, tightly sealed containers or unopened packages with manufacturer's name, labels, product identification, and lot numbers where appropriate.
 2. Store materials out of weather in original containers or unopened packages as recommended by manufacturer.
- B. **Replacements:** In the event of damage, immediately make repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

1.7 GUARANTEE:

- A. Guarantee workmanship against leakage for two years.

PART 2 – PRODUCTS

2.1 SEALANT MATERIALS:

- A. Materials shall be the products of one manufacturer and shall be either the ones upon which the design is based or the products of a manufacturer approved in accordance with Section 01 33 00.
- B. **Polysulfide Sealant:** Polysulfide base sealing compound. Sealant shall conform to performance standards of Thiokol Chemical corp., and all containers of sealant delivered to project shall bear Thiokol "tested and approved seal". Provide Type I (self-leveling) for joints in horizontal surfaces and Type II (non-sag) in joints in vertical or overhead surfaces. Class A or Class B shall be used for structural movements subject to 25 percent or 50 percent joint elongation respectively.
 1. Two-part: FS TT-S-00227.
- C. **Polyurethane Sealant:** Multi-part, self-leveling, FS TT-S-00227, Type I, Class A. Equivalent to THC-900 by Tremco.
- D. **Acrylic Terpolymer Sealant:** One-part non-sag, FS TT-S-00230. Equal to "Mono" by Tremco. Use for structural movement up to 150 percent of joint width.
- E. **Latex Acrylic Caulk:** Elastoseal Latex manufactured by Pacific Polymers, or equal.
- F. **Silicone:** One-part, primerless, paintable and highly flexible, FS TT-S-001543. Equal to General Electric 1300 Series.
- G. **Acoustical Sealant:** Highly resilient, permanently flexible, shrink and stain resistant, as manufactured by U.S.G., or equal.

2.2 BACKER ROD:

- A. Material: Open or expanded polyurethane, open or closed cell as recommended by sealant manufacturer, compatible with sealant.
- B. Non-staining Primer: Type as recommended by manufacturer of sealant material.
- C. Bond Breaker: Pressure sensitive adhesive polyethylene tape.
- D. Masking Tape: Pressure sensitive adhesive paper tape.

PART 3 - EXECUTION

3.1 INSPECTION:

- A. Examine joints to be sealed for construction defects which would adversely affect execution of work.
- B. Ensure that concrete has cured 28 days minimum.
- C. Do not start work until conditions are satisfactory.

3.2 PREPARATION:

- A. Cleaning: Clean joint surfaces, using joint cleaner as necessary, to be free of dust, dirt, oil, grease, rust, lacquers, laitance, release agents, moisture, or other matter which might adversely affect adhesion of sealant.
- B. Masking: Mask areas adjacent to joints.
- C. Priming: Apply primer, following manufacturer's instructions.

3.3 PRODUCT USAGE:

- A. Exterior:
 - 1. Horizontal traffic bearing joints: Multi-part polyurethane, self-leveling type.
- B. Interior:
 - 1. Interior static joints: Solvent release acrylic type.
- C. Standard colors to match adjacent work.
- D. Use only materials recommended by manufacturer for specific application.
- E. Caulk around doors, windows and hollow metal frame joints not fully welded.
- F. Apply sealant around, at laps, and/or mitered corners of all exposed flashing, metal reveals, louvers, coping, etc. and color sealant used shall match color of adjacent color.

3.4 APPLICATION:

- A. Install backing material in joints using blunt instrument to avoid puncturing. Do not twist rod while installing. Install backing so that joint depth is 50 percent of joint width, but a minimum of 1/4 inch deep.
- B. Apply sealant in joints using pressure gun with nozzle cut to fit joint width. Make sure sealant is deposited in uniform, continuous beads without gaps or air pockets. Replace where gaps or air pockets occur.

- C. Tool joints to required configuration with ten minutes of sealant application. If masking materials are used, remove immediately after tooling. Use an approved method of removing excess sealant where applies or where asked to have excess sealant removed by the Architect and Resident Inspector.

3.5 CLEANING:

- A. Remove excess materials adjacent to joints by mechanical means or with xylol (xylene) or mineral spirits as work progresses to eliminate evidence of spillage or damage to adjacent surfaces.
- B. Leave finished work in neat, clean condition with no evidence of spill overs onto adjacent surfaces.
- C. All exposed sealants used shall be of a type that can receive any or all paints as specified under the painting section.

END OF SECTION

**SECTION 08 71 00
FINISH HARDWARE**

PART 1 – GENERAL

1.1 SUMMARY:

- A. Section Includes: Finish hardware except as otherwise specified or specifically omitted herein.
 - 1. All finish hardware required to complete the work as dictated on the drawings and as herein specified. Provide all trim, attachments, and fastenings specified or required for proper and complete installation.
 - 2. Include all hardware under this section of the specifications that is not specified in other sections, whether or not such hardware is herein scheduled.

1.2 RELATED WORK:

- A. Related Work Specified Elsewhere:
 - 1. Documents affecting Work of this Section include, but are not necessarily limited to General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.
 - 2. Section 06 20 00 - Finish Carpentry.

1.3 SUBSTITUTIONS & SUBMITTALS:

- A. Refer to Section 01 33 00.
- B. SUBMITTALS: Submit five copies of schedule within 4 weeks after project has been awarded. Organize schedule into "Hardware Sets" with an index of doors and heading, indicating complete designations of every item required for each door or opening. Refer to Section 01 33 00. Include the following information:
 - 1. Type, style, function, size, quantity and finish of each hardware item. Use BHMA Finish codes as per ANSI A156.18.
 - 2. Name, part number and manufacturer of each item.
 - 3. Fastenings and other pertinent information.
 - 4. Location of hardware set cross referenced to indications on drawings both on floor plans and in door schedule.
 - 5. Explanation of all abbreviations, symbols, and codes contained in schedule.
 - 6. Mounting locations for hardware.
 - 7. Door and frame sizes and materials.
 - 8. Submit manufacturer's technical data and installation instructions for the electronic hardware.

1.4 QUALITY ASSURANCE:

- A. Qualifications:
 - 1. Obtain each kind of hardware (latch and lock sets, exit devices, hinges, and closers)

from only one manufacture, although several may be indicated as offering products complying with requirements.

2. Hardware supplier shall be a direct factory contract supplier who has in his employment a certified hardware consultant (AHC) who is available at all reasonable times during the course of the work for project hardware consultation to the Owner, Architect, and Contractor.
- B. Schedule Designations: Except as otherwise indicated, the use of one manufacturer's numeric designation system in schedules does not imply that another manufacturer's products will not be acceptable, unless they are not equal in design, size, weight, finish, function, or other quality of significance. See 1.3 A for substitutions.
 - C. Exit Doors: Openable at all times from the inside without the use of a key or any special knowledge or effort.
 - D. Fire-Rated Openings: Provide hardware for fire-rated openings in compliance with NFPA Standard No. 80. This requirement takes precedence over other requirements for such hardware. Provide only such hardware which has been tested and listed by UL for the type and size of each door and door frame labels. Latching hardware, door closers, ball bearing hinges, and seals are required whether listed in the Hardware Schedule or not.
 1. Where exit devices are required on fire-rated doors, provide supplementary marking on door UL label indicating "Fire Door to be Equipped with Fire Exit Hardware", and provide UL label on exit device indicating "Fire Exit Hardware".

1.5 DELIVERY, STORAGE, AND HANDLING:

- A. Acceptance at Site: Individually package each unit of finish hardware complete with proper fastening and appurtenances, clearly marked on the outside to indicate contents and specific locations in the Work.
- B. Deliver packaged hardware items at the times and to the locations (shop or field) for installation, as directed by the Contractor.

1.6 PROJECT CONDITIONS:

- A. Coordination: Coordinate hardware with other work. Furnish hardware items of proper design for use on doors and frames of the thickness, profile, swing, security and similar requirements indicated, as necessary for proper installation and function, regardless of omissions or conflicts in the information on the Contract Documents.
- B. Check the Shop Drawings for doors and entrances to confirm that adequate provisions will be made for the proper installation of hardware.

1.7 WARRANTY:

- A. Provide guarantee from hardware supplier as follows:
 1. Closers: Five years.
 2. All other Hardware: Two years.

PART 2 – PRODUCTS

2.1 MANUFACTURERS:

- A. Approval of manufacturers other than those listed shall be in accordance with paragraph 1.3 A.

<u>Item:</u>	<u>Manufacturer:</u>	<u>Acceptable Substitute:</u>
Hinges	Stanley	McKinney, Hager
Floor Closers	Dorma	Dor-O-Matic, Rixson
Locks	Corbin	As Specified
Exit Devices	Von Duprin	Precision, Dorma
Closers	Dorma	Norton, LCN
Auto Flush Bolts	Trimco	Glynn Johnson, DCI
Coordinators	Trimco	Glynn Johnson, DCI
Pulls	Trimco	Hager, Rockwood
Kickplates	Trimco	Hager, Rockwood
Stops	Trimco	Hager, Rockwood
Overhead Stops	Dorma	Glynn Johnson, Rixson
Thresholds	Pemko	Reese, Ultra
Seals & Bottoms	Pemko	Reese, Ultra
Aluminum Door Locks	Adams Rite	As Specified

- B. Furnish items of hardware required to complete the work in accordance with these specifications and the manufacturers instructions. Items of hardware not specified shall be provided even though inadvertently omitted from this specification. Items shall be of equal quality and type.
- C. Where the exact types of hardware specified are not adaptable to the finished shape or size of the members requiring hardware, furnish suitable types having as nearly as practicable the same operation and quality as the type specified, subject to Architect's approval.
- D. Carefully inspect Project for the extent of the finish hardware required to complete the Work. Where there is a conflict between these Specifications and the existing hardware, furnish finish hardware to specification.

2.2 MATERIALS:

- A. Locksets: Locksets and latchsets shall match existing doors and keyed alike.
- B. Hinges: Hinge open widths shall be minimum, but of sufficient size to permit door to swing 180°.
 - 1. Furnish 3 hinges per leaf to 7 foot, 6 inch height. Add one for each additional 30 inches in height or fraction thereof.
 - 2. Provide 5 inch heavy weight hinges on doors over 3 feet 5 inches width.
- C. Floor hinges shall have maximum degree dead stop permitted by trim of adjacent structure. Furnish special pins and longer spindles as may be required.
- D. Floor Closers: Provide center hung offset pivot closure assembly with threshold at Main Entry doors
- E. Exit Devices: Furnish devices at wood doors with sex bolts unless otherwise specified. Lever handle trim shall match lockets. The unlatching force shall not exceed 15 lbs. when applied in the direction of exit travel.
- F. Surface Door Closers: Full rack and pinion type with removable non-ferrous case.

Provide sex bolts and grommets at wood doors. Place closers inside building, stairs, and rooms. Closers shall be non-handed, non-sized, and adjustable.

1. Flush transom offset brackets shall be used where parallel arm closers are listed for doors with fixed panels over doors.
 2. Provide drop brackets, shoe supports, and blade stop spacers as required at narrow top rails.
 3. Exterior doors to have 8.5 lbs. maximum pressure to open, interior doors to have 5 lbs. maximum pressure to open, labeled fire doors to have 15 lbs. maximum pressure to open.
- G. Kick Plates: Provide with four beveled edges, .050 inches minimum thickness, 10-inches high by width less 2 inches. Furnish with machine or wood screws of bronze or stainless steel to match other hardware.
- H. Seals: Seals shall be finished to match adjacent frame color. U.L. label shall be applied on rated doors.
- I. Screws: Exposed screws shall be Phillips head.

2.3 FINISH:

- A. Generally to be BHMA 626 Dull Chromium.
1. Areas using BHMA 626 shall have push, pulls and kickplates of BHMA 630, Satin Stainless Steel, unless otherwise noted.
- B. Spray door closers to match other hardware, unless otherwise noted.
- C. Aluminum items shall be finished to match predominant adjacent material. Seals to coordinate with frame color.

2.4 KEYING REQUIREMENTS:

- A. Keying of cylinder locks shall be coordinated with the Owner to match existing. Keying system shall be approved by Owner's representative in writing. Furnish construction key system in accordance with lock manufacturers standard. Where interchangeable core systems used, use temporary cores for construction keying. Stamp keys "Do Not Duplicate".
- B. For protection of the Owner all locks and cylinders shall be keyed at the factory of the lock manufacturer where permanent records are maintained. Locks and cylinders shall be of the same manufacturer.
- C. Permanent keys shall be delivered only to Owner's representative.
- D. Keying Schedule: Submit three copies of separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.

PART 3 - EXECUTION

3.1 HARDWARE LOCATIONS:

- A. Lock: 38 inches from finished floor to center of lever.
- B. Door Pull: 40 inches from bottom of door to center of pull.
- C. Push Plate: 42 inches from bottom of door to center of plate.
- D. Pull Plate: 42 inches from bottom of door to center of pull.

- E. Exit Device: 40 inches from finished floor to center of pad.
- F. Deadlock Strike: 44 inches from floor, centered.
- G. Floor Stops: Where occurs in path of travel, locate within 4 inches of adjacent wall.

3.2 INSTALLATION:

- A. Install each hardware item per manufacturer's instructions and recommendations. Do not install surface mounted items until finishes have been completed on the substrate. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- B. Installation shall conform to local governing agency security ordinance, including requirements of A.D.A.

3.3 ADJUSTING:

- A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly.
- B. Inspection: Hardware supplier shall inspect hardware furnished within 10 days of contractors request and include with his guarantee a statement that this has been accomplished. Inspector or Contractor will sign off the hardware as being complete and correctly installed and adjusted. Further corrections of defective material shall be the responsibility of his representative.

3.4 SCHEDULE OF DOOR HARDWARE:

- A. Legend of listed manufacturers:

STA Stanley

VONVon Duprin

TRMTrimco

PEMPemko

ADAAdams Rite

COR Corbin

KEE Keedex

DOR Dorma

HEW Hewi

3.5 ALLOWANCE:

- A. The Contractor shall include an allowance in his proposal to the Owner for furnishing finish hardware in compliance with applicable Codes and regulations, as required by project design conditions and as specified herein.
- B. The Contract amount shall be adjusted by Change Order upon submittal and approval by the Owner and Architect in compliance.
- C. Submit 7 copies of a complete finish hardware list and catalog cuts of each hardware item denoting function, design and finish for each door denoted and scheduled on the Drawings. List shall include price of each hardware item and total amount including delivery, overhead and profit.

- D. Installation costs of all finish hardware is not a part of the hardware allowance. Installation cost is to be included in the Contract Bid Proposal.

END OF SECTION

**SECTION 09 11 00
METAL STUD FRAMING SYSTEM**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Top and bottom runners, studs, and blocking.
- B. Metal wall furring.
- C. Framing accessories
- D. Completely coordinate with work of all other trades.
- E. Although such work is not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure and complete installation.

1.2 RELATED SECTIONS

- A. Section 05 40 00 - Cold-Formed Metal Framing.
- B. Section 07 21 00 - Building Insulation.
- C. Section 09 26 00 - Gypsum Wallboard Systems.

1.3 REFERENCES

- A. ASTM A525 - General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
- B. ANSI/ASTM A591 - Steel Sheet, Cold-Rolled, Electrolytic Zinc-Coated.
- C. ASTM C645 - Non-Loadbearing Steel Studs, Runners, and Rigid Furring Channels.
- D. ASTM C754 - Installation of Steel Framing Members to Receive Screw- Attached Gypsum Wallboard, Backing Board, or Water-Resistant Backing Board.
- E. GA 203 - Installation of Screw-Type Steel Framing Members to Receive Gypsum Board.

1.4 QUALITY ASSURANCE

- A. Wherever a fire-resistance classification is indicated for walls or partitions, provide metal studs and accessories of type tested and listed for construction indicated.
- B. Perform work in accordance with GA 203 and ASTM C754.
- C. Maintain one copy of each document on site.

1.5 SYSTEM DESCRIPTION

- A. Metal stud framing and furring system for exterior wall infill.
- B. Metal stud framing system for interior walls.
- C. Maximum Allowable Deflection: 1/180 span.
- D. Design system to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

1.6 SUBMITTALS

- A. Submit product data of selected materials under provisions of Section 01 33 00.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Acceptable manufacturers:
 - 1. Framing components:
 - a. Wheeling Corrugating Co.
 - b. Ceco Corp.
 - c. Celotex Corp.
 - d. National Gypsum Co.
 - e. U. S. Gypsum Co.
 - f. Bostwick Steel Framing Co.
 - g. Flintkote Building Products Co.
- B. Screw type metal studs: ANSI/ASTM C645-76, roll-formed channel studs and tracks.
 - 1. Sizes as indicated.
 - 2. Gauges as indicated.
 - 3. Flanges: minimum 1-1/4 in wide.
 - 4. Galvanized sheet steel, ASTM A525-79, with G60 coating.
- C. Screw type furring channels: 20 ga. minimum.
 - 1. G60 coated.

2. 1-1/2" roll-formed to hat-shaped sections.
- D. Metal furring channels: 3/4 in rolled steel.
1. Painted.
 2. 0.3 LB/LF.
- E. Runner fasteners: Power drive type, to withstand minimum 190 LB shear and bearing when driven.
- F. Reinforcing for surface applied items: Minimum 6 in wide, 16 ga galvanized steel sheet.
1. Span between studs.
 2. Screw attach to studs.
- G. Lateral Reinforcement: 1-1/2" cold rolled channels.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine supporting structure and conditions under which studs will be installed.
- B. Correct conditions detrimental to proper completion.
- C. Installation constitutes acceptance of responsibility for performance.

3.2 INSTALLATION

- A. Refer to drawings for stud sizes.
- B. Install in accord with stud manufacturer's instructions.
- C. Provide continuous floor and top runner tracks sized to match studs.
 1. Align runners accurately at both floor and top.
 2. Secure runner tracks not to exceed 24 in on center.
 3. Secure at all corners and ends.
- D. Where partitions abut horizontal or vertical structural elements, provide slip or cushion type joint between partition and structure as recommended by stud manufacturer to prevent transfer of structural loads or movements to partitions.
- E. Where fire rated partition is indicated or required by code, extend to deck above.
- F. Space studs maximum 16 in on center, unless otherwise noted.

1. Provide additional studs to support corners, partition intersections and terminations of partitions, and at both sides of control joints.
- G. Use full length studs between runners.
- H. Friction fit studs to runners by positioning and rotating into place.
1. Positive attach runners to studs located at partition corners, intersections, and adjacent to openings, and as required for fire walls.
 2. Use 3/8 in self tapping screws or stud clinching tool on both flanges of each stud, top and bottom.
- I. At openings 36 in or wider provide two full length 20 ga studs at each jamb.
1. Provide one 20 ga stud at openings less than 36 in.
 2. For wall areas above and below openings, cut track to length, split flanges and bend webs at ends.
 3. Overlap and screw attach to jamb studs.
 4. Install cut to length intermediate studs between jamb studs at head and sill sections at same spacing as full length studs.
 5. To provide for control joints at openings, install additional stud, maximum 1/2 in from jamb stud. Do not fasten extra stud to track or jamb stud.
 6. Secure jamb studs to metal door frames with anchor clips with two screws or bolts per clip.
- J. At door openings, install reinforcing between studs at height of door stop, behind stop. See Section 08710 for height.
- K. Install reinforcing for all surface applied items.
- L. Align openings in studs to facilitate fishing of wires and/or conduit.
- M. Install snap on framing clips for structural steel members in accord with manufacturer's recommendations.
- N. Horizontally stiffen partitions with 1-1/2" cold rolled channels.

END OF SECTION

**SECTION 09 20 00
GYPSUM BOARD**

PART 1 – GENERAL

1.1 DESCRIPTION:

- A. Provide Gypsum Board and metal ceiling suspension system where shown on the drawings, as specified herein, and as needed for a complete and proper installation.

1.2 RELATED WORK:

- A. Related Work Specified Elsewhere:
 - 1. Documents affecting Work of this Section include, but are not necessarily limited to General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
 - 2. Section 07 90 00 - Joint Sealers:
 - 3. Section 09 90 00 - Painting.

1.3 QUALITY ASSURANCE:

- A. Regulatory Requirements:
 - 1. In addition to complying with applicable codes and regulations of governmental agencies having jurisdiction, comply with the requirements of the referenced standards of the Gypsum Association (GA).
 - 2. Where requirements of applicable codes, regulations and standards conflict with this specification, comply with the more stringent provisions.
- B. Source Quality Control:
 - 1. Tests: Materials for which physical characteristics have been stipulated shall have had such characteristics independently confirmed by laboratory tests employing industry recognized procedures. Both the laboratory performing the tests and the test methods employed will be subject to the approval of the Architect.

1.4 REFERENCES:

- A. Gypsum Association (GA):
 - 1. 216 - Application and Finishing of Gypsum Board.

1.5 SUBMITTALS:

- A. Product Data: Submit complete manufacturer's description literature and specifications in accordance with the provisions of Section 01 33 00.
 - 1. Materials List: Submit complete lists of materials proposed for use, giving the manufacturer's name, catalog number, and catalog cut for each item where applicable.
 - 2. Manufacturer's Recommendations: Submit the manufacturer's current recommended method of installation.

- B. Samples: In accordance with the provisions of Section 01 33 00, submit 12 inch by 12 inch samples of textured finish when required
- C. Test Reports: When and as directed by the Architect, submit certified laboratory test reports confirming physical characteristics of materials used in the performance of the work of this section.

1.6 DELIVERY, STORAGE AND HANDLING:

- A. Protection: Use all means necessary to protect the materials of this section before, during and after installation.
- B. Replacements: In the event of damage, immediately make repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

PART 2 – PRODUCTS

2.1 MATERIALS:

- A. Provide gypsum board materials in accordance with the requirements of GA-216.
- B. Typical Gypsum Board: 5/8 inch thick, maximum permissible lengths, ends square cut, tapered edges.
 - 1. Provide Non-Rated in all locations as scheduled.
 - 2. Provide UL rated Type X in locations as scheduled and as required by Code..
- C. Moisture Resistant Gypsum Board: 5/8 inch thick, maximum permissible length, ends square cut, tapered edges, moisture resistant type.
 - 1. Provide UL rated Type X as required by Code.
 - 2. Provide 5/8 inch moisture resistant gypsum board on all walls and ceilings at all toilet facilities and behind all mop sinks, sinks, drinking fountains, water heaters and at heights and lengths per UBC latest edition.

2.2 ACCESSORIES:

- A. Provide gypsum wallboard accessories in accordance with GA 216.
- B. Corner Beads: U.S. Gypsum Dur-A-Bead galvanized exterior corner with 1-1/4 inch flanges.
- C. Edge Trim: No. 200-A galvanized metal trim by U.S. Gypsum. Provide 'J' Trim at all door and window jambs.
- D. Reinforcing Tape, Joint Compound, Adhesive, Water, Fasteners: GA-216.
- E. Metal Furring Channels: U.S. Gypsum DWC 20 hat - shaped channels.

PART 3 – EXECUTION

3.1 INSTALLATION:

- A. Install gypsum board in accordance with the requirements of GA-216.
- B. Erect single layer standard gypsum board in direction most practical and economical, with ends and edges occurring over firm bearing. Comply with requirements of U.L. design No. U305 at 1 hour fire rated walls.
- C. Use drywall 1-1/4 inch type W bugle head screws when fastening gypsum board to wood

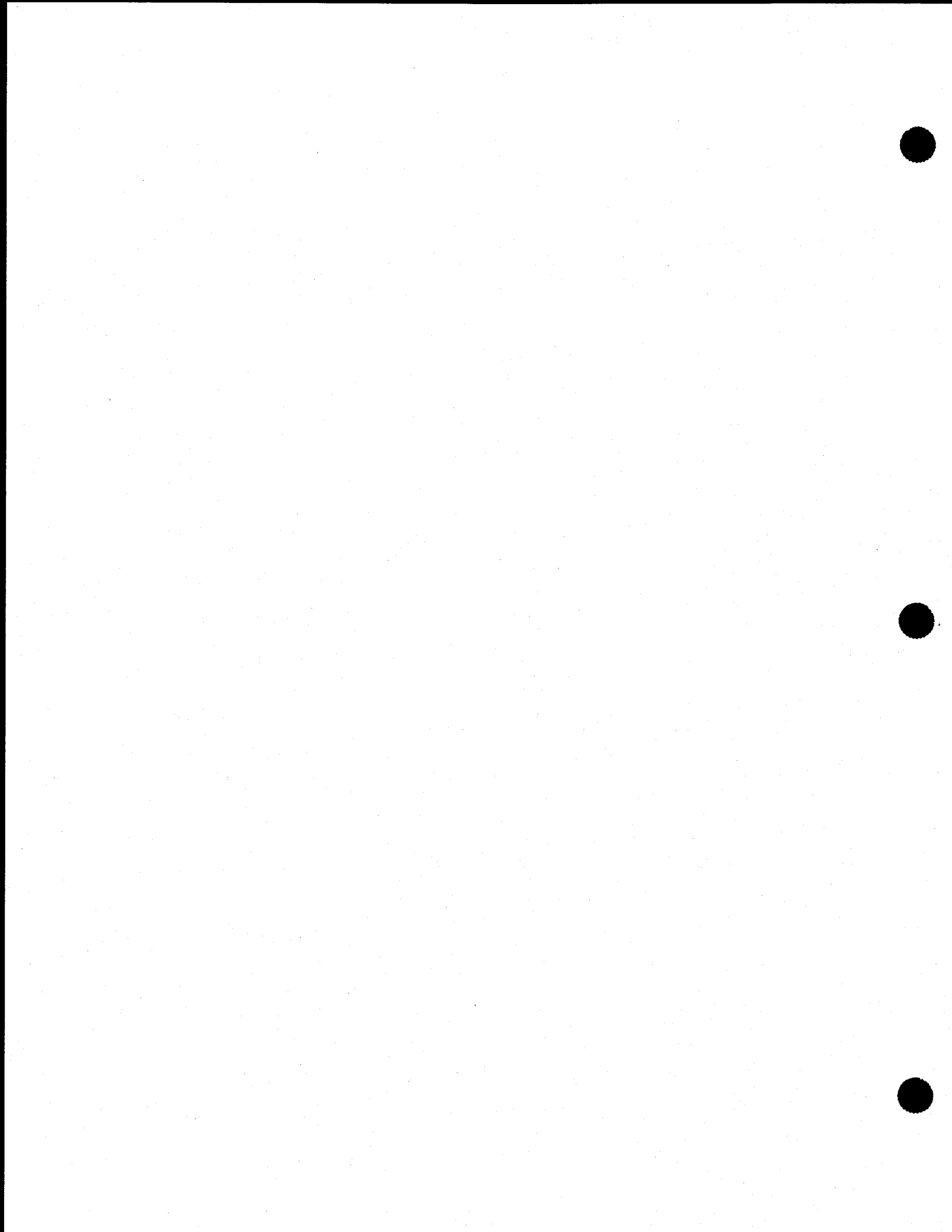
framing and to metal studs. Use 1-1/8 inch Type S bugle head screws to metal furring.

- D. Treat cut edges and holes in moisture resistant gypsum board with sealant.
- E. Place corner beads at external corners. Use longest practical lengths. Place edge trim where gypsum board abuts dissimilar materials, unless concealed.
- F. Tape, fill, and sand exposed joints, edges, corners, openings and fixings, to produce surface ready to receive surface finishes. Feather coats onto adjoining surfaces so that camber is maximum 1/32 inch.
- G. Provide skin coat of joint compound over all exposed gypsum board that is to be painted, including ceilings, soffits, walls, etc. Leave film thick enough to fill imperfections in the joint work and smooth the paper texture to equal the surface of the joint and fasteners per United States Gypsum Company recommendations.
- H. Provide orange peel finish on all walls and ceilings unless otherwise noted or directed by the Architect. Submit sample to the Architect for approval.
- I. Ceiling suspension system:
 - 1. Install in accordance with ASTM C636, CISCA installation standards and other applicable Code references.
 - 2. Install in accordance with manufacturer's current printed recommendations.
 - 3. Install in accordance with approved shop drawings. Locate ceiling in accordance with main tee dimensions relative to elevations.
 - 4. Main tees shall be spaced a maximum of 48" on center and supported by hanger wires spaced a maximum of 48" on center, attaching directly to structure above.
 - 5. Cross tees shall be spaced per manufacturer's recommendations.
 - 6. Hanger wires are required within 12" on both sides of a pivoted splice clip and within 12" of a transition clip.

3.2 ADJUSTING AND CLEANING:

- A. Remove gypsum wallboard and accessory materials from project and sweep clean all areas affected. Repair any damaged or unacceptable surfaces.
- B. Remove and re-do defective work. May use Type P pressure-sensitive backing glass-fiber tape for retaping small defective work areas.

END OF SECTION



**SECTION 09 65 16
VCT FLOORING**

PART 1 – GENERAL

1.1 DESCRIPTION

This section specifies the installation of solid vinyl tile flooring, vinyl composition tile flooring, rubber tile flooring, and accessories.

1.2 SUBMITTALS

- A. Submit in accordance with Section 01 33 00, SUBMITTAL PROCEDURES.
- B. Manufacturer's Literature and Data:
 - 1. Description of each product.
 - 2. Resilient material manufacturer's recommendations for adhesives, underlayment, primers and polish.
 - 3. Application and installation instructions.
- C. Samples:
 - 1. Tile: 300 mm by 300 mm (12 inches by 12 inches) for each type, pattern and color.
 - 2. Edge Strips: 150 mm (6 inches) long, each type.
 - 3. Feature Strips: 150 mm (6 inches) long.
- D. Shop Drawings:
 - 1. Layout of patterns as to match existing.
 - 2. Edge strip locations showing types and detail cross sections.
- E. Test Reports:
 - 1. Abrasion resistance: Depth of wear for each tile type and color and volume loss of tile, certified by independent laboratory.
 - 2. Tested per ASTM F510.

1.3 DELIVERY

- A. Deliver materials to the site in original sealed packages or containers, clearly marked with the manufacturer's name or brand, type and color, production run number and date of manufacture.
- B. Materials from containers which have been distorted, damaged or opened prior to installation will be rejected.

1.4 STORAGE

- A. Store materials in weather tight and dry storage facility.
- B. Protect from damage from handling, water, and temperature.

1.5 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American Society for Testing and Materials (ASTM):
 - D4078-02 (2008).....Water Emulsion Floor Finish
 - E648-10.....Critical Radiant Flux of Floor Covering Systems Using a Radiant Energy Source
 - E662-09.....Specific Optical Density of Smoke Generated by Solid Materials
 - E1155-96 (R2008)Determining Floor Flatness and Floor Levelness Numbers
 - F510-93 (R 2008).....Resistance to Abrasion of Resilient Floor Coverings Using an Abrader with a Grit Feed Method

- F710-08.....Preparing Concrete Floors to Receive Resilient Flooring
- F1066-04 (R2010).....Vinyl Composition Floor Tile
- F1344-10.....Rubber Floor Tile
- F1700-04 (R2010).....Solid Vinyl Floor Tile
- C. Resilient Floor Covering Institute (RFCI):
 - IP #2.....Installation Practice for Vinyl Composition Tile (VCT)
- D. Federal Specifications (Fed. Spec.):
 - SS-T-312.....Tile Floor: Asphalt, Rubber, Vinyl and Vinyl Composition

PART 2 – PRODUCTS

2.1 GENERAL

- A. Furnish product type, materials of the same production run and meeting following criteria.
- B. Use adhesives, underlayment, primers and polish recommended by the floor resilient material manufacturer.
- C. Critical Radiant Flux: 0.45 watts per sq. cm or more, Class I, per ASTM E 648.
- D. Smoke density: Less than 450 per ASTM E662.

2.2 VINYL COMPOSITION TILE

- A. ASTM F1066, Composition 1, //Class I (solid color)// Class 2 (through pattern) //, 300 mm (12 inches) square, 3 mm (1/8 inch) thick.
- B. Color and pattern uniformly distributed throughout thickness.

2.3 SOLID VINYL-TILE

- A. ASTM F1700, 300 mm (12 by 12 inches) square, 3 mm (1/8 inch) thick, homogenous throughout.
- B. Color and Pattern uniformly distributed throughout thickness.
- C. Where solid vinyl tiles are specified, seek products with recycled content.

2.4 RUBBER TILE

- A. ASTM F1344, Class 1, homogenous rubber tile, B, through mottled, 300 mm (12 inches) square, 3 mm (1/8 inch) thick.
- B. Color and pattern uniformly distributed throughout tile.
- C. Molded pattern wearing surface base thickness 3 mm (1/8 inch) thick.
- D. Where rubber tile is used provide tiles with a minimum of 90% post consumer rubber.

2.5 ADHESIVES

- A. Comply with applicable regulations regarding toxic and hazardous materials Green Seal (GS-36) for commercial adhesive.
- B. Use low-VOC adhesive during installation. Water based is preferred over solvent based adhesives.

2.6 PRIMER (FOR CONCRETE SUBFLOORS)

As recommended by the adhesive and tile manufacturer.

2.7 LEVELING COMPOUND (FOR CONCRETE FLOORS)

- A. Provide cementitious products with latex or polyvinyl acetate resins in the mix.
- B. Determine the type of underlayment selected for use by the condition to be corrected.

2.8 POLISH AND CLEANERS

- A. Cleaners RFCI CL-1.
- B. Polish: ASTM D4078.

2.9 EDGE STRIPS

- A. 28 mm (1-1/8 inch) wide unless shown otherwise.
- B. Bevel from maximum thickness to minimum thickness for flush joint unless shown otherwise.
- C. Extruded aluminum, mill finish, mechanically cleaned:
 - 1. Drill and counter sink edge strip for flat head screws.
 - 2. Space holes near ends and approximately 225 mm (9 inches) on center between.
- D. Resilient Edge Strip or Reducer Strip: Fed. Specs. SS-T-312, Solid vinyl.

2.10 SCREWS

Stainless steel flat head screw.

2.11 FEATURE STRIPS

- A. Use same material as floor tile.
- B. Sizes and shapes as shown.

PART 3 - EXECUTION

3.1 PROJECT CONDITIONS

- A. Maintain temperature of materials a minimum of 22 °C (70 °F,) for 48 hours before installation.
- B. Maintain temperature of rooms where work occurs between 21 °C and 27 °C (70 °F and 80 °F), for at least 48 hours, before, during and after installation.
- C. Do not install flooring until building is permanently enclosed and wet construction in or near areas to receive tile materials is complete, dry and cured.

3.2 SUBFLOOR PREPARATION

- A. Verify that concrete slabs comply with ASTM F710. At existing slabs, determine levelness by F-number method in accordance with ASTM E1155. Overall value shall not exceed as follows:
FF30/FL20
- B. Correct conditions which will impair proper installation.
- C. Fill cracks, joints and other irregularities in concrete with leveling compound:
 - 1. Do not use adhesive for filling or leveling purposes.
 - 2. Do not use leveling compound to correct imperfections which can be corrected by spot grinding.
 - 3. Trowel to smooth surface free of trowel marks, pits, dents, protrusions, cracks or joints.
- D. Clean floor of oil, paint, dust, and deleterious substances: Leave floor dry and cured free of residue from existing curing or cleaning agents.
- E. Concrete Subfloor Testing:
Determine Adhesion and dryness of the floor by bond and moisture tests as recommended by RFCI manual MRP.
- F. Perform additional subfloor preparation to obtain satisfactory adherence of flooring if subfloor test patches allows easy removal of tile.
- G. Prime the concrete subfloor if the primer will seal slab conditions that would inhibit bonding, or if priming is recommended by the tile or adhesive manufacturers.
- H. Preparation of existing installation shall include the removal of existing resilient floor and existing adhesive. Do not use solvents to remove adhesives.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions for application and installation unless specified otherwise.
- B. Mix tile from at least two containers. An apparent line either of shades or pattern variance will not be accepted.
- C. Tile Layout:
 - 1. If layout is not shown on drawings, lay tile symmetrically about center of room or space with joints aligned.
 - 2. No tile shall be less than 150 mm (6 inches) and of equal width at walls.
 - 3. Place tile pattern in the same direction; do not alternate tiles.
- D. Trim tiles to touch for the length of intersections at pipes and vertical projections, seal joints at pipes with waterproof cement.
- E. Application:
 - 1. Apply adhesive uniformly with no bare spots.
 - a. Conform to RFC1-TM-6 for joint tightness and for corner intersection unless layout pattern shows random corner intersection.
 - b. More than 5 percent of the joints not touching will not be accepted.
 - 2. Roll tile floor with a minimum 45 kg (100 pound) roller. No exceptions.
 - 3. The Resident Engineer may have test tiles removed to check for non-uniform adhesion, spotty adhesive coverage, and ease of removal. Install new tile for broken removed tile.
- F. Installation of Edge Strips:
 - 1. Locate edge strips under center line of doors unless otherwise shown.
 - 2. Set resilient edge strips in adhesive. Anchor metal edge strips with anchors and screws specified.
 - 3. Where tile edge is exposed, butt edge strip to touch along tile edge.
 - 4. Where thin set ceramic tile abuts resilient tile, set edge strip against floor file and against the ceramic tile edge.

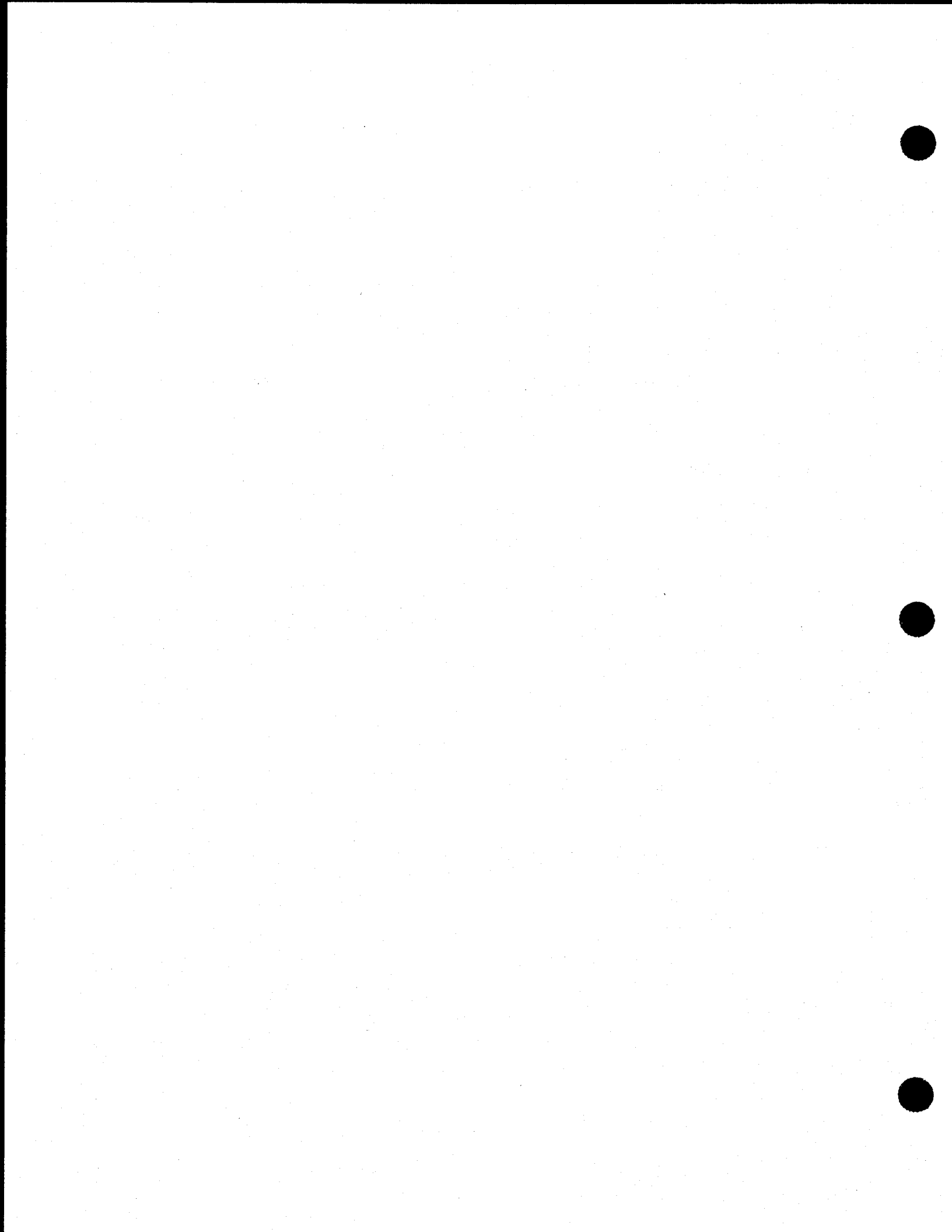
3.4 CLEANING AND PROTECTION

- A. Clean adhesive marks on exposed surfaces during the application of resilient materials before the adhesive sets. Exposed adhesive is not acceptable.
- B. Keep traffic off resilient material for a minimum 72 hours after installation.
- C. Clean and polish materials in the following order:
 - 1. For the first two weeks sweep and damp mopped only.
 - 2. After two weeks, scrub resilient materials with a minimum amount of water and a mild detergent. Leave surface clean and free of detergent residue.
 - 3. Apply polish to the floors in accordance with the polish manufacturer's instructions.
- D. When construction traffic occurs over tile, cover resilient materials with reinforced kraft paper properly secured and maintained until removal is directed by Resident Engineer. At entrances and where wheeled vehicles or carts are used, cover tile with plywood, hardboard, or particle board over paper, secured and maintained until removal is directed by Resident Engineer.
- E. When protective materials are removed and immediately prior to acceptance, replace any damage tile, re-clean resilient materials, lightly re-apply polish and buff floors.

3.6 LOCATION

- A. Unless otherwise specified or shown, install tile flooring, on floor under areas where casework, laboratory and pharmacy furniture and other equipment occurs, except where mounted in wall recesses.
- B. Extend tile flooring for room into adjacent closets and alcoves.

END OF SECTION



**SECTION 09 90 00
PAINTING**

PART 1 – GENERAL

1.1 DESCRIPTION:

- A. Provide Finish Painting where shown on the drawings, as specified herein, and as needed for a complete and proper installation.

1.2 RELATED WORK:

- A. Related Work Specified Elsewhere:
 - 1. Documents affecting Work of this Section include, but are not necessarily limited to General Conditions and Sections in Division 1 of these Specifications.

1.3 WORK INCLUDED:

- A. Surface preparation.
- B. Prime coat application.
- C. Intermediate coat application.
- D. Finish coat application.
- E. Upon completion of work under this contract, all surfaces within the contract limits and within vision, will have a painters finish on the interior except excluded items defined herein. (Include all roof mounted mechanical and electrical equipment factory primed or factory finished and in full view.)

1.4 WORK NOT INCLUDED:

- A. Surfaces Not To Be Painted:
 - 1. Prefinished walls, ceiling and floor coverings.
 - 2. Items with factory-applied final finish.
 - 3. Concealed ducts, pipes and conduit.
 - 4. Glass, plastic laminate, ceramic tile, anodized aluminum, stainless steel or chromium plating.
 - 5. Surfaces specifically scheduled or noted on the drawings not to be painted.
 - 6. Equipment identification, performance rating, name or nomenclature plates or Code required labels.

1.5 SUBMITTALS:

- A. Product data under provisions of Section 01 33 00.
- B. Shop drawings under provisions of Section 01 33 00.
- C. Samples under provisions of Section 01 33 00.
 - 1. Submit three samples 8-1/2 inches by 11 inches in size illustrating range of colors and textures available for each surface finishing product scheduled for selection.

2. Prepare wood samples on type and quality of wood specified.
- D. Manufacturer's application instructions under provisions of Section 01 33 00.
- E. Certified laboratory test reports submitted as directed by the Architect confirming physical characteristics of materials used in the performance of the work of this section.

1.6 QUALITY ASSURANCE:

- A. Product Manufacturer: Company specializing in manufacturing quality paint and finish products with ten years experience.
- B. Applicator: Company specializing in commercial painting and finishing with five years experience.
- C. Field Samples:
 1. Provide sample under provisions of Section 01 33 00.
 2. Provide field sample panel, illustrating coating color, texture and finish for each color scheduled.
 3. Locate as approved by Architect.
 4. Approved sample may remain as part of the work.
 5. Do not proceed with coating application until sample panel has been approved.

1.7 REGULATORY REQUIREMENTS:

- A. Conform to Environmental Protection Agency (EPA), California Air Resources Board (CARB) and South Coast Air Quality Management District (SCAQMD) regulations.
- B. Comply with applicable codes and regulations of governmental agencies having jurisdiction including those having jurisdiction over airborne emissions and industrial waste disposal. Where those requirements conflict with this specification, comply with the more stringent provisions.

1.8 DELIVERY, STORAGE AND HANDLING:

- A. Deliver products to site in sealed original containers.
- B. Container labeling to include manufacturer's name, type of paint, brand code, coverage, surface preparation, drying time, clean-up, color designation and instructions for mixing and reducing.
- C. Provide adequate storage facilities. Store paint materials at minimum ambient temperature of 45 degrees F and maximum of 90 degrees F, in well ventilated area unless required otherwise by manufacturer's instructions.
- D. Take precautionary measures to prevent fire hazards and spontaneous combustion.
- E. Provide replacements, and make immediate repairs in the event of damage to the approval of the Architect and at no additional cost to the Owner.

1.9 PROJECT SITE CONDITIONS:

- A. Provide continuous ventilation and heating facilities to maintain surface and ambient temperatures above 45 degrees F 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 when relative humidity is above 50 percent,

unless required otherwise by manufacturer's instructions.

- C. Minimum Application Temperature for Latex Paints: 45 degrees F for interiors unless required otherwise by manufacturer's instructions.
- D. Minimum Application Temperature for Varnish and Transparent Finishes: 65 degrees F for interior unless required otherwise by manufacturer's instructions.
- E. Provide lighting levels sufficient to conduct painting operations.
- F. Measure moisture content of surface 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.
- F. Beginning of installation means acceptance of existing surfaces.

1.10 MAINTENANCE:

- A. Extra material to be not less than one full gallon of each color, type of paint, in new unopened containers. Label each container for identification.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

- A. Design is based on the products manufactured by Dunn-Edwards Corporation, Los Angeles, CA (213) 771-3330.
- B. Substitutions: Under provisions of Section 01 60 00, submit chemical formulations of material submitted for substitution.

2.2 MATERIALS:

- A. Products used are to be from one manufacturer and shall be either the ones upon which the design is based or the products of a manufacturer approved in accordance with Section 01 60 00.
- B. Paints: provide ready-mixed, except field catalyzed coatings. Pigments shall be fully ground maintaining soft paste consistency, capable of being readily and uniformly dispersed to a complete homogeneous mixture.
- C. Paint Accessory Materials: Other materials not specified but required to achieve required finishes shall be of high quality and approved by the manufacturer.
- D. Paints shall have good flowing and brushing properties and be capable of drying or curing free of streaks and sags.

PART 3 – EXECUTION

3.1 EXAMINATION:

- A. Prior to commencing the work of this section, carefully inspect previously installed work and verify that such work is complete to the point where this installation may properly commence.
- B. Verify that work of this section may be installed in accordance with applicable codes, regulations and standards, the Contract Documents and the approved submittals.

3.2 PREPARATION:

- A. Protection: Protect previously installed work and materials which may be affected by work of this section.
- B. Surface Preparation:
 - 1. Perform preparation and cleaning procedures in accordance with coating manufacturer's instructions for each substrate condition.
 - 2. Concrete and masonry surfaces shall be cleaned free of all dirt, efflorescence and other foreign matter. Glazed surfaces on concrete shall be roughened to uniform texture.
 - 3. Ferrous metal not provided with a shop prime shall be cleaned free of oil, grease and foreign matter. Scratched and abraded areas shall be touched up with a corrosion resistant primer. Shop primed surfaces shall be preprimed then finished with appropriate intermediate and finish coats.
 - 4. Galvanized metal shall be cleaned free of oil and pretreated with the manufacturer's recommended pretreatment. Cleaned and pretreated galvanizing metal shall be primed the same day that cleaning had been performed.
 - 5. Remove hardware and accessories, machined surfaces, plates, lighting fixtures and similar items in place and not to be finish painted, or provide surface applied protection. Reinstall removed items. Mask all fire rating labels on doors before painting and remove when finished.
 - 6. Seal wood required to be job-painted. Prime edges, ends, face underside and backsides of counters, cases, cabinets and other specified surfaces. Use spar varnish for backpriming where transparent finish is required.
 - 7. Shellac and seal marks which may bleed through surface finishes.
 - 8. Gypsum Board Surfaces: Fill minor defects, joint and nail head depression with spackling compounds. Prime in accordance with primer manufacturer's recommendations.
 - 9. Shop Primed Steel Surfaces: 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.

3.3 MATERIAL PREPARATION:

- A. Mix, prepare and store painting and finishing materials in accordance with manufacturer's directions.

3.4 APPLICATION:

- A. Apply painting and finishing materials in accordance with the manufacturer's submittals, as approved. Use applicators and techniques best suited for the material and surfaces to which applied.
- B. The number of coats specified is the minimum that shall be applied. Apply additional coats when undercoats, stains or other conditions show through final paint coat, until paint film is of uniform finish, color and appearance. Second coat shall be tinted a different shade from the first and third coats.
- C. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat

only, wherever possible.

- D. Sand lightly and dust clean between succeeding coat.
- E. Reprime shop primed metal surfaces. Apply prime coat to material which is required to be painted or finished and which is required to be painted or finished, and which has not been prime coated by others.
- F. Apply each material at not less than the manufacturer's recommended spreading rate to provide a total dry film thickness of not less than 5.0 mils for the entire coating system of prime and finish coats for 3-coat work.
- G. Provide a total dry film thickness of not less than 3.5 mils for the entire coating system of prime and finish coat for 2-coat work.
- H. Prime back surfaces of interior and exterior wood work with primer coat.
- I. Prime back surface of interior woodwork scheduled to receive stain or varnish finish with gloss varnish reduced 25 percent with mineral spirits.
- J. Do not paint over rated labels on doors and frames.

3.5 ADJUSTING AND CLEANING:

- A. Remove, finish or repaint work not in compliance with specified requirements.
- B. Keep premises free from unnecessary accumulation of tools, equipment, surplus materials and debris.
- C. Promptly remove paint where spilled, splashed, smeared and splattered.
- D. Upon completion of work, leave premises neat and clean to satisfaction of Owner.

3.6 FINISH SCHEDULE: Based on Dunn Edwards.

A. INTERIOR DRYWALL - FLAT

1st Coat - Sealer	W101
2nd Coat - Finish	W401

B. INTERIOR DRYWALL - SEMI-GLOSS

1st Coat - Sealer	E28-1
2nd Coat - Intermediate	E22-1
3rd Coat - Finish	E5*

NOTE: FOR SEALER ON WATER RESISTANT GYPSUM BOARD USE
DUNN-EDWARDS E28-1.

C. INTERIOR WOOD - PAINT FINISH - SEMI-GLOSS

1st Coat - Primer	E22-1
2nd Coat - Intermediate	E22-1
3rd Coat - Finish	E5*

END OF SECTION



**SECTION 10 44 00
FIRE EXTINGUISHERS, CABINETS AND ACCESSORIES**

PART 1: GENERAL

1.1 SUMMARY:

- A. Section Includes: Furnishing and installing fire extinguishers, cabinets, and accessories.
- B. Related Sections:
 - Gypsum Board Section 09 20 00
 - Painting Section 09 90 00

1.2 REFERENCES:

- A. National Fire Protection Association:
 - NFPA 10-90 Standard for Extinguishers
- B. Underwriters' Laboratories, Inc.:
 - UL Fire Damageability Standards

1.3 SUBMITTALS:

- A. General: Submittals shall be according to Section 01 33 00 – Submittals.
- B. Manufacturer's Literature: Submit 7 copies of the manufacturer's descriptive data for the fire extinguisher equipment to be used on this project.
- C. Installation Instructions: Submit 7 copies of the manufacturer's installation instruction for the fire extinguisher equipment to be used on this project.
- D. Operating and Maintenance Instructions: Submit 7 copies of the manufacturer's operating and maintenance instructions for the fire extinguisher equipment to be used on this project.

1.4 QUALITY ASSURANCE:

- A. Failure Criteria: Not limited to the following:
 - 1. Loss of pressure in extinguisher.
 - 2. Loosening of bracket from wall.

PART 2: PRODUCTS

2.1 MATERIALS:

- A. Fire Extinguishers: Epoxy enameled aluminum shell containing pressurized multi-purpose dry chemical sized as indicated in chart below.

<u>Occupancy</u>	<u>Office</u>	<u>Warehouse</u>	<u>Mech. Equip.</u>	<u>Veh. Repair</u>
Hazard Classification	Low	Moderate	Moderate	High
Fire Classification	A	A	BC	B
Required Exting	1A-10BC	2A-10BC	4A-60BC	4A-60BC

- B. Fire Extinguisher Brackets: Manufacturer's standard wall-mounted bracket.

PART 3: EXECUTION

3.1 PREPARATION:

- A. Wall Construction: Provide backup wall reinforcement to accommodate eccentric loading of extinguisher and the surface-mounted wall bracket specified.

3.2 INSTALLATION:

- A. General: Place extinguishers the week prior to the final inspection of the building. Mount brackets firmly to wall construction. Top of extinguisher shall be 5 feet maximum above floor, regardless of mounting method. The Contractor shall fill, pressurize, and mount extinguishers in wall brackets.

PART 4: MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT:

- A. Units: The work described in this section will not be measured for payment.

4.2 BASIS OF PAYMENT:

- A. Payment: No direct payment for the work described under this section will be made. The Contractor shall include consideration for this item in the bid price for other items of the Contract.

END OF SECTION

SECTION 21 22 00

SAPPHIRE FIRE SUPPRESSION

PART 1 - GENERAL

1.01 SCOPE

This specification outlines the requirements for the "Total Flood" Novec 1230 Clean Agent Fire Suppression System (no alternatives) protecting the 1st floor Computer Room with automatic detection and control. Major system component shall be of a single manufacturer and shall be installed by an authorized distributor certified for the design, installation and service of Novec 1230 suppression systems.

The work described in this specification includes all engineering, labor, materials, equipment and service necessary, and required, to complete and test the suppression system.

1.02 APPLICABLE STANDARDS AND PUBLICATIONS

A. The design, equipment, installation, testing and maintenance of the Clean Agent Suppression Systems shall be in accordance with the applicable requirements set forth in the latest edition of the following codes and standards:

1. National Fire Protection Association (NFPA) Standards:

No. 2001 Clean Agent Fire Extinguishing Systems
No. 70 National Electric Code
No. 72 National Fire Alarm Code

2. Factory Mutual Systems (FM) Publication
Factory Mutual Approval Guide

3. Underwriters Laboratories, Inc. (UL) Publication
Fire Protection Equipment Directory with quarterly supplements

4. National Electrical Manufacturers Association (NEMA) Publication
Enclosures for Industrial Controls and Systems

5. U.S. Environmental Protection Agency, Protection of Stratospheric Ozone 59 FR
13044 (SNAP)

6. Requirements of the Authority Having Jurisdiction (AHJ)

B. The standards listed, as well as all other applicable codes, standards, and good engineering practices, shall be used as "minimum" design standards.

1.03 REQUIREMENTS

The Suppression System installation shall be made in accordance with the drawings, specifications, and applicable National Fire Protection Association standards. All equipment and devices used shall be listed in both UL Fire Equipment Directory and the Factory Mutual Approval Guide.

1.04 EXCLUSIONS

The work listed below shall be provided by others, or under other sections of this specification:

- A. Dedicated 120 VAC or 220 VAC power supply to the system control panel.
- B. Interlock wiring and conduit for shutdown of HVAC, dampers and /or electrical power supplies, relays or shunt trip breakers.
- C. Connection to local/remote fire alarm system and or listed central alarm station(s).
- D. Sealing of the protected area (including dampers, door closures, ceiling tile clips, etc.).

1.05 QUALITY ASSURANCE

A. MANUFACTURER

- 1) The manufacturer of the suppression system hardware and detection components shall be ISO 9001 registered.
- 2) The name of the manufacturer shall appear on all major components.
- 3) All devices, components and equipment shall be the products of the same manufacturer.
- 4) All devices, components and equipment shall be new, standard products of the manufacturer's latest design and suitable to perform the functions intended.
- 5) All devices and equipment shall be U.L listed and/or FM approved.
- 6) Locks for all cabinets shall be keyed alike.

B. INSTALLER

- 1) The installing contractor shall be an experienced firm regularly engaged in the installation of automatic Clean Agent, or similar, fire suppression systems in strict accordance with all applicable codes and standards.
- 2) The installing contractor shall, as a minimum, provide 24-hour emergency service, 7 days a week and shall be able to respond to an emergency situation within 4 hours of receiving an emergency trouble call.
- 3) The installing contractor shall be an authorized stocking distributor of the Clean Agent system equipment.

C. SUBMITTALS

- 1) The installing contractor shall submit the following design information and drawings for approval within 21 days of award and prior to delivery of materials:
 - a. Field installation layout drawings having a scale of not less than 1/8" = 1'-0" or 1:100 detailing the location of all agent storage tanks, nozzles, pipe runs including pipe sizes and lengths, control panel(s), detectors, manual pull stations, abort stations, audible and visual alarms, etc.

- b. Separate layouts, or drawings, shall be provided for each level, (i.e.; room, underfloor, and above ceiling) and for mechanical and electrical work.
 - c. Electrical layout drawings shall show the location of all devices and include point-to-point conduit runs and a description of the method(s) used for detector mounting.
 - d. Provide an internal control panel wiring diagram which shall include power supply requirements and field wiring termination points.
 - e. Separate drawing providing symbol legend to identify all symbols used.
 - f. Complete hydraulic flow calculations, from a UL listed computer program, shall be provided for all engineered Clean Agent systems. Calculation sheet(s) must include the manufacturers name and UL listing number for verification. The individual sections of pipe and each fitting to be used, as shown on the isometrics, must be identified and included in the calculation. Total agent discharge time must be shown and detailed by zone.
 - g. Provide calculations for the battery stand-by power supply taking into consideration the power requirements of all alarms, initiating devices and auxiliary components under full load conditions.
 - h. A complete sequence of operation shall be submitted detailing all alarm devices, shutdown functions, remote signaling, damper operation, time delay and agent discharge for each zone or system.
- 2) Submit drawings, calculations and system component data sheets for approval to the local fire prevention agency, owner's insurance underwriter, and all other authorities having jurisdiction before starting installation.

PART 2 – SYSTEM REQUIREMENTS

2.01 SYSTEM DESCRIPTION AND OPERATION

- A. The system shall be a SAPPHIRE Total Flood Novec 1230 Fire Suppression System.
- B. The system shall provide a Novec 1230 minimum design concentration of 4.2% by volume for Class A hazards and 5.85% by volume for Class B hazards in all areas and/or protected spaces, at the minimum anticipated temperature within the protected area. System design shall not exceed 10% for normally occupied spaces, adjusted for maximum space temperature anticipated, with provisions for room evacuation before agent release.
- C. The system shall be complete in all ways. It shall include all mechanical and electrical installation, all detection and control equipment, agent storage containers, Novec 1230 agent, discharge nozzles, pipe and fittings, manual release and abort stations, audible and visual alarm devices, auxiliary devices and controls, shutdowns, alarm interface, caution/ advisory signs, functional checkout and testing, training and all other operations necessary for a functional, UL Listed Novec 1230 Clean Agent Suppression System.
- D. The general contractor shall be responsible for sealing and securing the protected spaces against agent loss and/or leakage during the 10-minute "hold" period.
- E. The systems shall be actuated by photoelectric detectors installed for maximum area coverage of 250 sq. ft. (23.2 m²) per detector, in both the room and underfloor protected

spaces. If the airflow is one air change per minute, photoelectric detectors only shall be installed for maximum area coverage of 125 sq. ft. (11.6 m²) per detector. (Ref. NFPA No. 72.)

- F. Detectors shall be Cross-Zoned detection requiring two detectors to be in alarm before release.
- G. Automatic operation of each protected area shall be as follows:
 - 1) Actuation of one (1) detector, within the system, shall:
 - a. Illuminate the "ALARM" lamp on the control panel face.
 - b. Energize a horn/strobe device.
 - c. Transfer auxiliary contacts which can perform auxiliary system functions such as: i) Operate door holder/closures on access doors, ii) Transmit a signal to a fire alarm system, iii) Shutdown HVAC equipment.
 - 2) Actuation of a 2nd detector, within the system, shall:
 - a. Illuminate the "PRE-DISCHARGE" lamp on the control panel face.
 - b. Energize a pre-discharge horn/strobe device.
 - c. Shut down the HVAC system and/or close dampers.
 - d. Start time-delay sequence (not to exceed 60 seconds).
 - e. System abort sequence is enabled at this time.
 - 3) After completion of the time-delay sequence, the SAPPHIRE Clean Agent system shall discharge and the following shall occur:
 - a. Illuminate a "SYSTEM FIRED" lamp on the control panel face.
 - b. Shutdown of all power to high-voltage equipment
 - c. Energize a visual indicator(s) outside the hazard in which the discharge occurred.
 - 4) The system shall be capable of being actuated by manual discharge devices located at each hazard exit. Operation of a manual device shall duplicate the sequence description above except that the time delay and abort functions shall be bypassed. The manual discharge station shall be of the electrical actuation type and shall be supervised at the main control panel.

2.02 MATERIALS AND EQUIPMENT

A. GENERAL REQUIREMENTS

- 1) The SAPPHIRE Clean Agent Novec 1230 System materials and equipment shall be standard products of the supplier's latest design and suitable to perform the functions intended. When one or more pieces of equipment must perform the same function(s), they shall be duplicates produced by one manufacturer.
- 2) All devices and equipment shall be UL Listed and/or FM approved.

- 3) Each system shall have its own supply of clean agent.
- 4) The system design can be modular, central storage, or a combination of both design criteria.
- 5) Systems shall be designed in accordance with the manufacturer's guidelines.
- 6) Each supply shall be located within the hazard area, or as near as possible, to reduce the amount of pipe and fittings required to install the system.
- 7) The clean agent shall be stored in Novec 1230 Agent Storage tanks. Tanks shall be super-pressurized with dry nitrogen to an operating pressure of 360 psi @ 70 °F (24.8 bar at 21 °C). Tanks shall be of high-strength low alloy steel construction and conform to NFPA 2001.
- 8) Tanks shall be actuated by a resettable electric actuator with mechanical override located at each agent tank. Explosive devices shall not be permitted.
- 9) Each tank shall have a pressure gauge and low pressure switch (optional) to provide visual and electrical supervision of the container pressure. The low-pressure switch shall be wired to the control panel to provide an audible and visual "Trouble" alarms in the event the tank pressure drops below 290 psi (20 bar). The pressure gauge shall be color coded to provide an easy, visual indication of container pressure.
- 10) Tanks shall have a pressure relief provision that automatically operates before the internal pressure exceeds 730 psi (50 bar).
- 11) Engineered discharge nozzles shall be provided within the manufacturer's guidelines to distribute the Novec 1230 agent throughout the protected spaces. The nozzles shall be designed to provide proper agent quantity and distribution. Nozzles shall be available in 1/2 in. through 2 in. pipe sizes. Each size shall be available in 180° and 360° distribution patterns.
- 12) Distribution piping, and fittings, shall be installed in accordance with the manufacturer's requirements, NFPA 2001 and approved piping standards and guidelines. All distribution piping shall be installed by qualified individuals using accepted practices and quality procedures. All piping shall be adequately supported and anchored at all directional changes and nozzle locations.
 - a. All piping shall be reamed, blown clear and swabbed with suitable solvents to remove burrs, mill varnish and cutting oils before assembly.
 - b. All pipe threads shall be sealed with Teflon tape pipe sealant applied to the male thread only.

B. CONTROL PANEL

- 1) The control panel shall be an ANSUL model AutoPulse 542R approved releasing panel.
- 2) The detection control system and components shall be UL listed and FM approved for use as a local fire alarm system with releasing device service.
- 3) The control system shall perform all functions necessary to operate the system detection, actuation, and auxiliary functions.

- 4) The control system shall include battery standby power to support 24 hours in standby and 5 minutes in alarm.
- 5) The control system shall be microprocessor based, utilizing a distributed processing concept. A single microprocessor failure shall not impact operation of additional modules in the system.
- 6) The control system shall be capable of supporting Cross Zone Detection.
- 7) The control system shall supply integrated 2.0 amp (minimum) power supply circuitry.
- 8) The control system shall contain four (4) initiating circuits:
 - a. Each circuit shall be capable of Class A (Style D) or Class B (Style A) operation.
 - b. Each circuit shall be capable of operating up to fifteen (15) approved detectors or thirty (30) detectors per system.
 - c. Each circuit shall be capable of monitoring contact devices configured for manual release, manual alarm, system abort, trouble input or auxiliary (non-fire) input.
- 9) Each control system shall contain release circuits for activation of a fire suppression system:
 - a. Each circuit shall be capable of Class B (Style Y) operation.
 - b. Each circuit shall be rated for a minimum 1.5 amp @ 24 VDC.
- 10) Each control system shall contain two (2) indicating appliance circuits for annunciation:
 - a. Each circuit shall be capable of Class A (Style B) or Class B (Style Y) operation.
 - b. Each circuit shall be rated for a minimum 1.5 amp @ 24 VDC.
- 11) Each control system shall provide an auxiliary power supply rated for 2 amps @ 24 VDC.
- 12) Each control system shall provide two (2) SPST relays: one for common alarm and one for common trouble.

C. DETECTORS

- 1) The detectors shall be spaced and installed in accordance with the manufacturer's specifications and the guidelines of NFPA 72. Maximum spacing of 250 sq. ft. per detector.

D. MANUAL RELEASE STATIONS

- 1) The electric manual release shall be a dual action device which provides a means of manually discharging the suppression system when used in conjunction with the detection system.
- 2) The manual release shall or manual pull station shall be a dual action device requiring two distinct operations to initiate a system actuation.
- 3) Manual actuation shall bypass the time delay and abort functions and shall cause all release and shutdown devices to operate in the same manner as if the system had operated automatically.
- 4) Manual release shall be located at each exit from the protected hazard.

E. ABORT STATIONS

- 1) The abort station shall be the "Dead Man" type and shall be located next to each manual release.
- 2) The abort station shall be supervised and shall indicate a trouble condition at the control panel, if depressed, and no alarm condition exists.
- 3) "Locking" or "Keyed" abort stations shall not be permitted.

F. AUDIBLE / VISUAL ALARMS

- 1) Audible / Visual devices shall operate from the control panel.
- 2) An audible/visual device shall be placed outside each exit door from the protected space. Provide an advisory sign at each light location.

G. CAUTION and ADVISORY SIGNS

Signs shall be provided to comply with NFPA 2001 and the recommendations of the Novec 1230 equipment provider.

- 1) Entrance sign: (1) required at each entrance to a protected space.
- 2) Manual discharge sign: (1) required at each manual discharge station.
- 3) Flashing light sign: (1) required at each flashing light over each exit from a protected space.

H. SYSTEM and CONTROL WIRING

- 1) All system wiring shall be furnished and installed by the contractor.
- 2) All wiring shall be installed in electrical metallic tubing (EMT), or conduit, and must be installed and kept separate from all other building wiring.
- 3) All system components shall be securely supported independent of the wiring. Runs of conduit and wiring shall be straight, neatly arranged, properly supported, and installed parallel and perpendicular to walls and partitions.
- 4) The sizes of the conductors shall be those specified by the manufacturer. Color-coded wire shall be used. All wires shall be tagged at all junction points and shall be free from shorts, earth connections (unless so noted on the system drawings),

and crosses between conductors. Final terminations between the control panel and the system field wiring shall be made under the direct supervision of a factory-trained representative.

- 5) All wiring shall be installed by qualified individuals, in a neat and workmanlike manner, to conform to the National Electrical Code, Article 725 and Article 760, except as otherwise permitted for limited energy circuits, as described in NFPA 72. Wiring installation shall meet all local, state, province and/or country codes.
- 6) The complete system electrical installation, and all auxiliary components, shall be connected to earth ground in accordance with the National Electrical Code.

PART 3 – TESTING AND DOCUMENTATION

3.01 SYSTEM INSPECTION and CHECKOUT

After the system installation has been completed, the entire system shall be checked out, inspected and functionally tested by qualified, trained personnel, in accordance with the manufacturer's recommended procedures and NFPA standards.

- A. All containers and distribution piping shall be checked for proper mounting and installation.
- B. All electrical wiring shall be tested for proper connection, continuity and resistance to earth.
- C. The complete system shall be functionally tested, in the presence of the owner or his representative.
- D. Each detector shall be tested in accordance with the manufacturer's recommended procedures, and test values recorded.
- E. All system and equipment interlocks, such as door release devices, audible and visual devices, equipment shutdowns, local and remote alarms, etc. shall function as required and designed.
- F. Each control panel circuit shall be tested for trouble by inducing a trouble condition into the system.

3.02 TRAINING REQUIREMENTS

Prior to final acceptance, the installing contractor shall provide operational training to each shift of the owners personnel. Each training session shall include control panel operation, manual and abort functions, trouble procedures, supervisory procedures, auxiliary functions and emergency procedures.

3.03 OPERATION and MAINTENANCE

Prior to final acceptance, the installing contractor shall provide complete operation and maintenance instruction manuals for each system, to the owner. All aspects of system operation and maintenance shall be detailed, including piping isometrics, wiring diagrams of all circuits, a written description of the system design, sequence of operation and drawing(s) illustrating control logic and equipment used in the system. Checklists and procedures for emergency situations, troubleshooting techniques, maintenance operations and procedures shall be included in the manual.

3.04 AS-BUILT DRAWINGS

Upon completion of each system, the installing contractor shall provide copies of system "As-Built" drawings to the owner. The drawings shall show actual installation details including all equipment locations (i.e.: control panel(s), agent container(s), detectors, alarms, manuals and aborts, etc.) as well as piping and conduit routing details.

3.05 ACCEPTANCE TESTS

- A. At the time "As-Built" drawings and maintenance/operations manuals are submitted, the installing contractor shall submit a "Test Plan" describing procedures to be used to test the control systems. The Test Plan shall include a step-by-step description of all tests to be performed and shall indicate the type and location of test apparatus to be employed. The tests shall demonstrate that the operational and installation requirements of this specification have been met. All tests shall be conducted in the presence of the owner and shall not be conducted until the Test Plan has been approved.
- B. The tests shall demonstrate that the entire control system functions as designed and intended. All circuits shall be tested: automatic actuation, solenoid and manual actuation, HVAC and power shutdowns, audible and visual alarm devices and manual override of abort functions. Supervision of all panel circuits, including AC power and battery power supplies, shall be tested and qualified.
- C. A room pressurization test shall be conducted, in each protected space, to determine the presence of openings which would affect the agent concentration levels. The test(s) shall be conducted using the Retro-Tec Corp. Door Fan system, or equivalent, with integrated computer program. All testing shall be in accordance with NFPA 2001.
- D. If room pressurization testing indicates that openings exist which would result in leakage and/or loss of the extinguishing agent, the installing contractor shall be responsible for coordinating the proper sealing of the protected space(s) by the general contractor or his sub-contractor or agent. The general contractor shall be responsible for adequately sealing all protected space(s) against agent loss or leakage. The installing contractor shall inspect all work to ascertain that the protected space(s) have been adequately and properly sealed. If the first room pressurization test is not successful, in accordance with these specifications, the installing contractor shall direct the general contractor to determine, and correct, the cause of the test failure. The installing contractor shall conduct one additional room pressurization test, at no additional cost to the owner. Copies of successful test results shall be submitted to the owner for record. Upon acceptance by the owner, the completed system(s) shall be placed into service.

3.06 WARRANTY

All Ansul system components furnished and installed under this contract shall be warranted against defects in design, materials and workmanship for the full warranty period which is standard with the manufacturer, but in no case less than one (1) year from the date of system acceptance.

END OF SECTION



**SECTION 23 05 00
BASIC MECHANICAL REQUIREMENTS**

PART 1: GENERAL

1.1 SECTION INCLUDES

Basic Mechanical Requirements specifically applicable to Division 23 Sections, in addition to Division 1 - General Requirements.

1.2 DESCRIPTION

Furnish materials and perform labor required to execute this work as indicated on the drawings, as specified and as required to complete the work of this section, except as otherwise herein specifically excluded.

1.3 WORK INCLUDED

The complete Heating, Ventilating and Air Conditioning (HVAC) and Plumbing systems (Fire Protection systems), including but not limited to these major items.

1. Coordinate work of this Section with related trades.
2. Verify applicable dimensions at the jobsite.
3. Air handling unit fan coils.
4. Split heat pump systems.
5. Air filters.
6. Duct systems; supply, return and exhaust complete with fire dampers, combination fire-smoke dampers, and manual dampers.
7. Diffusers, registers.
8. Mechanical and plumbing equipment bases and roof curbs.
9. Exhaust supply, return fans and air curtains.
10. Furnishing and installation of miscellaneous hangers, supports, sleeves, inserts, anchors and other auxiliary equipment for systems under this Division.
11. Duct lining and insulation.
12. Condensate drain, refrigeration piping, fittings, valves and specialties, and insulation.
13. Shop drawings.
14. Equipment identification.
15. Equipment and systems adjustments and balancing.

16. Air and water systems testing, adjusting and balancing.
17. Written operating and maintenance instructions.
18. Record drawings.

1.4 WORK SPECIFIED ELSEWHERE

Concrete, Architectural Sheet Metal, Door and Exterior Wall Louvers, Painting and Electrical.

1.5 SITE INSPECTION

Contractor shall familiarize himself with the conditions at the site. No allowance will be made subsequently for any error through negligence in observing the site conditions. Contractor shall observe and make cost allowance for any mechanical and/or electrical items that must be relocated to accommodate the installation or servicing of any item covered under this contract.

1.6 ORDINANCES, REGULATIONS AND CODES

- A. References to Technical Societies, Trade Organizations, Governmental Agencies is made in Division 15 in accordance with the following abbreviations.

AFI - Air Filter Institute
AMCA - Air Moving & Conditioning Association
ARI - Air Conditioning & Refrigeration Institute
ASHRAE - American Society of Heating,
Refrigerating and Air Conditioning Engineers
ASME - American Society of Mechanical Engineers
ASTM - American Society of Testing Materials
AWSC - American Welding Society Code
ANSI - American National Standards Institute
CBC - California Building Code
CCR - California Code of Regulations
CEC - California Electrical Code
CFC - California Fire Codes
CMC - California Mechanical Code
CPC - California Plumbing Code
DSA - Division of the State Architect
FIA - Factory Insurance Association
NAFM - National Association of Fan Manufacturers
NEMA - National Electrical Manufacturer's
Association
NFPA - National Fire Protection Association
ORS - Office of Regulatory Services
OSHPD - Office of Statewide Health, Planning and
Development
SCAQMD - South Coast Air Quality Management
District
SMACNA - Sheet Metal and Air Conditioning
Contractors National Association
UFC - Uniform Fire Code

UL - Underwriter's Laboratories
UPC - Uniform Plumbing Code

- B. Requirements of Regulatory Agencies: Materials and installation shall comply with applicable local, state, and national codes and ordinances. Rulings and interpretations of the enforcing agencies shall be considered as part of the local codes. No extras will be permitted for furnishing items required by the local codes but not specified or shown on the drawings.
- C. Codes and Standards:
 - 1. UBC and California Amendments (California Building Code - Part 2, Title 24, CCR).
 - 2. UMC and California Amendments (California Mechanical Code - Part 4, Title 24 CCR).
 - 3. UPC and California Amendments (California Plumbing Code - Part 5, Title 24 CCR).
 - 4. Uniform Fire Code with State Amendments (California Fire Code - Part 9, Title 24 CCR).
 - 5. National Fire Protection Association's - National Fire Code.
- D. Nothing in these drawings and specifications is to be construed to permit work in violation thereof. Ordinances, regulations and codes are to be construed as minimum requirements.
- E. The responsibility of the Architect to conduct construction reviews of the Contractor's performance is not intended to include the adequacy of the Contractor's safety measures in, on, or near the construction site.
- F. Ventilating, refrigeration and electrical equipment and appliances are required to be approved by the Underwriters' Laboratories, Inc., or other nationally recognized testing agency and installed per the testing agency's specifications.

1.7 PERMITS, FEES AND INSPECTIONS

Obtain and pay for all necessary permits, fees, assessments, complimentary drawings, required by any legally constituted public authorities having jurisdiction.

1.8 DRAWINGS AND SPECIFICATIONS

- A. The Architect's decision will be final on interpretation of the Drawings and Specifications.
- B. The Drawings and Specifications are complimentary. Any work called for on the Drawings and not mentioned in the Specifications, or vice versa, shall be performed as though fully set forth in both.
- C. Piping, ductwork and other equipment shown as existing has been taken from the Owner's drawings. Contractor shall verify exact location in field before proceeding with the work.

- D. Where codes, standards, drawings or specifications conflict, the most stringent shall prevail, unless prior approval for variance is obtained. Specific details on the drawings shall supercede the specification in the event of a conflict.
- E. Alternate support or seismic detail shall have prior approval by the Architect; and the Contractor shall obtain agency approval without any additional cost or time to the contract and without any time penalty on the work schedule.

1.9 SUBMITTALS

- A. Before starting work, the Contractor shall furnish for the approval of the Architect, shop drawings and itemized equipment lists, complete in all details that he proposes to install. All items shall be submitted at the same time. Conform to Section 01 33 00.
- B. Submittals must be specific to this project with respect to model number, capacities, performance, etc., generic submittals will not be accepted.
- C. Submittals shall include, but not necessarily be limited to the following which are mandatory:
 - 1. Draw Equipment Layouts to 1/4" scale, including equipment, piping accessories, and showing clearances for operating and servicing.
 - 2. Schedule of pipe, fittings, valves, with manufacturer and catalog number.
 - 3. Specialties, valves, gauges and thermometers of all types.
 - 4. Foundations, supports, hangers, inserts.
 - 5. Earthquake supports and calculations.
 - 6. Expansion loops, expansion joints, guides, and anchors.
 - 7. Insulation.
 - 8. Ventilation and air conditioning equipment, specialties and the air control systems.
 - 9. Fans, fan characteristic curves, fan tests.
 - 10. Dampers, louvers, grilles, registers, diffusers.
 - 11. Shop fabrication drawings and installation drawings of ductwork and piping layouts. Submit for approval prior to fabrication. Drawings shall indicate dimensions from bottom of piping and ductwork to finish floor level.
 - 12. Wiring diagrams, control panel board, motor starters and controls for electrically operated equipment furnished by mechanical trades.
 - 13. Automatic control system diagrams.
 - 14. Underground and above ground tanks, accessories.
 - 15. Water treatment components and accessories.

16. Exhaust, supply and return fans.
17. Access panels.
18. Backflow preventers.
19. Clean-outs
20. Fixture carriers.
21. Hangers, inserts, supports, anchors.
22. Pipe, fittings and specialties.
23. Pipe isolators.
24. Fire protection system shop drawings.
25. Roof flashing.
26. Sleeves, escutcheons, caulking, waterproofing, fireproofing.
27. Strainers
28. Expansion joints, guides and anchors.
29. Shop fabrications drawings and calculations.
30. Approved seismic drawings and calculations for applicable piping equipment, as required ORS/DSA.
31. Special and miscellaneous products furnished under this section and not listed herein.

1.10 RECORD DRAWINGS AND MANUALS

- A. Record Set During the Work: At site, maintain at least one set of Drawings as a Field Record Set. Also maintain at least one copy of all Addenda, Modifications, approved submittals, correspondence, and transmittals at site. Keep Drawings and data in good order and readily available to Architect and Owner.
- B. Changes: Clearly and correctly mark Record Drawings to show changes made during the construction process at the time the changed work is installed. No such changes shall be made in the work unless authorized by the Architect.
- C. Final Record Drawings: Conform to Division 1 requirements.
- D. Preparation of Final Record Drawings: Contractor shall transfer recorded changes in the work indicated on the Field Record Set to the record set. Changes shall be neatly and clearly drawn and noted by skilled draftsmen, and shown technically correct.
- E. Approval: Prior to Architect's inspection for Substantial Completion, submit the Final Record Drawings to the Architect for review, and make such revisions as may be

necessary for Final Record Drawings to be a true, complete, and accurate record of the work.

- F. Manuals: Obtain data from the various manufacturers and submit instruction, operation, and maintenance manuals as required and to the extent required under other Sections.
- G. Contents: Each manual shall have an index listing the contents. Information in the manuals shall include not less than:
 - 1. General introductions and overall equipment description, purpose, functions and simplified theory of operation.
 - 2. Specifications
 - 3. Installation instructions, procedures, sequences, and precautions, including tolerances for level, horizontal and vertical alignment.
 - 4. Grouting requirements.
 - 5. List showing lubricants for each item of mechanical equipment and recommended lubrication intervals.
 - 6. Start-up and beginning operation procedures.
 - 7. Operational procedures.
 - 8. Shutdown procedures.
 - 9. Maintenance and calibration procedures
 - 10. Parts lists
 - 11. Name, address and telephone number of each manufacturer's local representative.
- H. Manual Submittals: Unless otherwise specified, each submittal shall include two copies of each manual, one of which will be returned to the Contractor, marked to show the required review. When approved, deliver five copies to Engineer unless otherwise specified.
- I. "As-Built" drawings of ductwork and piping, including all elbows, transitions, damper and valve locations shall be provided prior to commencement of air and water balance.

1.11 QUALITY OF EQUIPMENT, MATERIALS AND WORKMANSHIP

Unless otherwise specified, equipment and materials used in the installation shall be new and in perfect condition when installed. Articles provided for the same general purpose or use shall be of the same make. Workmanship shall be of the best quality and none but competent mechanics skilled in their trades shall be employed. Furnish the services of an experienced superintendent, who shall be constantly in charge of the work, together with all necessary journeymen, helpers and laborers required.

1.12 SEISMIC DESIGN

Contractor shall be responsible for anchors and connections of mechanical work to the building structure including calculations for approval by ORS/DSA, as applies, for items or work, where approval is deferred or where alternate support or anchorage detail is proposed to prevent damage as a result of an earthquake, including manufactured equipment, the connection and integrity of shop fabricated and field fabricated materials and equipment. The anchorage of all pipes, ducts, conduits, fixtures, equipment, etc. shall withstand the lateral forces and shall accommodate calculated building displacement as required by the California Building Code, and local city/county codes. (Building equipment and connections therefore shall be designed to resist lateral seismic forces equal to 1.0 of equipment weight to working allowable stress. Cantilever posts supporting equipment shall be designed to resist lateral seismic forces equal to 0.5 of equipment weight to allowable working stress. Conform to the following:

1. In accordance with Title 24, 1998 CBC Section 1632A and Table No. 16A-O, details shall be provided for the seismic anchorage of all mechanical and electrical equipment, anchorage details shall be based upon appropriate design calculations.
2. For equipment weighing 400 pounds or more anchorage details and appropriate design calculations shall be submitted as part of the mechanical and electrical drawings. "Deferred Approval" items will not be permitted unless specifically approved by the plan check supervisor.

Exception: Attachments of equipment weighting less than 400 pounds and supported directly on the floor or roof structure, furniture, or temporary or movable equipment and equipment weighing less than 20 pounds that is supported by vibration isolation devices suspended from the roof, wall or floor, need not be detailed on the plans provided the following notes are included on the mechanical and electrical plans.

3. The seismic anchorage of mechanical and electrical equipment shall conform to C.C.R. Title 24, 1998 CBC Section 1632A and Table 16A-O. Anchorage details for roof/floor-mounted equipment shall be shown on plans.

1.13 SUBSTITUTIONS AND CHANGES

- A. The design has been based on data from certain manufacturers, suitable for each application. Recommendations for alternative manufacturers are made for each product, except when "no substitutions permitted" is indicated.
- B. It is the intent of the Owner to have this project constructed with materials, products and system originally designed and specified into the project.
- C. Alternatives that may require the modification, realignment and/or adjustment of other associated components, including impact on other trades, shall be accomplished at no additional cost or time to the contract and shall have the approval of the Architect.
- D. Should the Contractor elect to propose substitutions for the Owner's interest, the substitutions shall be in compliance with Section 01 60 00.

1.14 APPROVALS

The Architect will have the right to accept or reject equipment, materials, workmanship, tests and determine when the Contractor has complied with the requirements herein specified.

1.15 SELECTION AND ORDERING OF EQUIPMENT AND MATERIALS

Immediately after award of the Contract and after the approval of submittals by the Architect, the Contractor shall arrange for the purchase and delivery of equipment and materials required, in ample quantities and at the proper time. He shall deliver to the Architect a complete list of equipment and materials ordered, giving descriptions, plate numbers, brochures, name of the wholesalers, date of the orders and approximate delivery dates.

1.16 LOCATIONS AND ACCESSIBILITY

- A. Drawings show pipe and ductwork diagrammatically. Conform to Drawings as closely as possible in layout work. Vary run of piping, run and shape of ductwork and make offsets during progress of work as required to meet structural and other interferences as approved by Architect. Install piping and ductwork to best suit field conditions after coordinating with other trades. Run exposed piping and ductwork parallel to, or at right angle to, building walls. Keep horizontal lines as close to bottom of structures as possible. Conform to ceiling heights established on Drawings.
- B. Install equipment in such a manner as to be readily accessible for maintenance and repairs. Install piping, ducts and conduit in such a manner as to preserve headroom, avoid obstructions and keep openings and passageways clear.
- C. Installation at valves, thermometers, gauges, cleanouts, dampers, controls, steam and water specialties, duct access doors or any other indicating equipment or specialties requiring reading, adjustment, inspection, maintenance shall be conveniently and accessibly located with reference to the finished building.
- D. Where wall and ceiling access doors are required but not shown, such doors shall be furnished under other sections and as directed by the Architect. Coordinate this requirement with appropriate trade.
- E. If changes in the indicated locations or arrangements are required, they shall be made without additional charges.
- F. In an existing area, where required, remove, reinstall, reconnect or replace, etc., any existing work to accommodate new work without any additional cost to the Owner. Material shall match existing, unless otherwise specified or approved in writing by the Architect.
- G. Provide sheaves and belts if required, to Test, Adjust and Balance Agency, to allow air moving equipment to meet flow requirements specified at no additional cost to the Owner.

1.17 COORDINATION OF TRADES

- A. Contractor shall coordinate all trades in the interest of obtaining the most practical overall arrangement of equipment, piping, conduit, and ducts and to maintain maximum headroom and accessibility.
- B. No extras will be allowed for changes made necessary by interference between trades.
- C. Submit Composite Drawings in accordance with Special Conditions. Include dimensioned plans, elevations, sections and details and give complete information particularly as to the kinds and types of materials and equipment, size and location of sleeves, inserts, attachments, chases, openings, conduits, ducts, boxes, lighting, structural interferences. Coordinate these Composite Drawings and field layouts in the field for proper relationship to work of applicable trades based on field conditions. Contractor shall have competent personnel readily available for coordinating, checking, and supervision of field layouts. The procedures for submittals and resubmittals, and final distribution shall be as specified in Section 01 33 00. Do not start installation of work involved under Composite Drawings until the Architect reviews applicable submittal. Discrepancies between the Drawings and Composite Drawings shall be specifically noted and identified on the Composite Drawings. Drawings for the various trades involved shall be submitted as required and reviewed prior to preparation of Composite Drawings.
 - 1. Equipment Foundations and Bases: Furnish certified details and drawings for approval before fabrication. Furnish parts necessary for each foundation sub base and support.
 - 2. Pipe Sleeves and Inserts: Furnish and install pipe sleeves and pipe support inserts before concrete is poured.
 - 3. Roof, Wall and Floor Openings: Furnish Shop Drawings showing exact locations and sizes of openings through roofs, walls and floors.
 - 4. Concrete: Conform to Concrete Section of the Specifications.

1.18 GUARANTEES

- A. Contractor shall guarantee workmanship, equipment and materials installed under his contract for a period of not less than one (1) year from the date of Substantial Completion. Should any defects occur during this period, the Contractor shall promptly repair or replace the defective item and any other damage caused to the building free of charge to the Owner, including cost of labor and materials.
- B. Guarantee included in this section to cover:
 - 1. Faulty or inadequate design of equipment or material installed.
 - 2. Improper assembly or erection.
 - 3. Defective workmanship or material.
 - 4. Incorrect or inadequate operation or other failure.
- C. He shall guarantee the complete and perfect operation of the entire system and that equipment will be supported in such a way as to be free of objectionable vibration and noise.

- D. Furnish the parts and labor to replace any items found to be defective in the refrigeration equipment within the guarantee period.
- E. In addition to other guarantees, furnish free maintenance for the refrigeration equipment, including replacement of refrigerant and oil, for a period of one (1) year. This shall include regular monthly maintenance and "On Call" service if required.
- F. For equipment bearing a manufacturer's warranty in excess of one year, furnish a copy of the warranty to the Owner, who shall be named as beneficiary.

1.19 PROTECTION OF EQUIPMENT AND MATERIALS

Provide adequate storage facilities for equipment and materials on the site and shall make provisions to protect such materials and equipment from damage.

1.20 CLOSING-IN OF UNINSPECTED WORK

Contractor shall not allow or cause any of the work, specifically ductwork and piping, to be covered up or enclosed until it has been inspected, tested, and approved by the Architect. Should any of work be covered up or enclosed before such inspection and test, he shall at his own expense, uncover the work and after it has been inspected, tested, and approved, make repairs with such materials as may be necessary to restore work to its original and proper condition.

1.21 BUILDING FOOTING CLEARANCES

Under no circumstances shall pipes, ducts, or conduits penetrate footings. They shall cross below footings or through sleeves above footings. Those running parallel to footings shall have the minimum clearance from the cone of influence indicated on the Drawings or as required by Code.

1.22 DAMAGE BY LEAKS

Contractor shall be responsible for all damage to any part of the premises caused by rain leaks through or around ducts or pipes, leaks or breaks in piping, equipment or fixtures furnished or installed by him for a period of one (1) year from the date of Substantial Completion.

1.23 EQUIPMENT LABELS

Equipment provided under this Section shall be provided with the manufacturer's metal identification labels attached to each individual piece of equipment showing complete performance characteristics, size, model and serial number.

1.24 EXCAVATION, TRENCHING AND BACKFILLING

- A. Excavating, trenching and backfilling for utilities within the building area shall be done in conformity with Division 2 - Sitework. Piping shall be installed promptly after excavation in order to keep the trenches open as short a time as possible.
- B. Excavating, trenching and backfilling for utilities outside the building area shall be done in conformity with Division 2 - Site work.

- C. Any existing underground piping and conduit that is encountered shall be properly shored and protected from damage. Active piping shall be left intact and undamaged.

1.25 PRELIMINARY OPERATION

Should the Owner request that any portion of the plant, apparatus, or equipment be operated for the Owner's beneficial use prior to the final completion and acceptance of the work, the Contractor shall conform to Beneficial Occupancy Provisions of the General Conditions. Such operation shall be under the supervision and direction of the Contractor. Such preliminary operation shall not be construed as an acceptance of any of the work.

1.26 MAINTAINING EXISTING SERVICES

- A. The premises and existing building at the site will be in use at the time the work of this Section is in progress. Contractor shall conduct his work so as to cause no inconvenience or danger to the personnel on the premises.
- B. He shall maintain continuity of service to the existing mechanical systems, except for designated intervals during which connections can be made. The scheduling of the shut down period shall be at a time directed by the Architect.
- C. In some instances, it may be necessary to defer work in certain areas and locations until such time as existing facilities can be relocated or rearranged by the Owner. Therefore, whenever it becomes necessary for the Contractor to perform work under this contract in areas in which the Owner's work is being performed. This contractor shall advise the Architect relative to this requirement and shall follow closely the directive issued by the Architect insofar as time and procedure are concerned. Allow Owner 72 hours prior notice.
- D. This contractor shall include in his bid all premium time to which he may be subjected for performing work in such procedure and at such time as may be necessary to cause the least interference with the function of the Owner.

1.27 ELECTRICAL WORK

- A. Coordinate with Division 26 in making the line and low voltage electrical connections and be responsible for the operation of the equipment furnished under this section.
- B. Voltage for electrical work will be included in Division 26. However, any control wiring which is required that is not shown on the control diagram shall be as described under this Section. In the event that the Contractor chooses to provide equipment that requires extra expense in the power or control wiring, he shall pay additional electrical costs.
- C. Safety switches, starters, circuit breakers, unless provided as a portion of package equipment, and the electrical connections of mechanical equipment to the electrical power service shall be provided under Division 26.
- D. Interconnecting wiring, safety switches, relays, controllers and motor starters which are integral components of packaged equipment shall be provided as an integral part of that equipment.
- E. All interconnecting power wiring and conduits shall be provided by Division 26.

- F. Control wiring shall be provided by Division 26, unless otherwise indicated on the drawings.
- G. Conduit for control wiring shall be provided by Division 26.

"END OF SECTION"

**SECTION 23 05 53
IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT**

PART 1: GENERAL

1.1 WORK INCLUDED

PART 2: PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Seton Name Plate Company.
- B. Brady Company

2.2 MATERIALS

- A. Color: Unless specified otherwise, conform with ASME A13.1.
- B. Plastic Nameplates: Laminated three-layer plastic with engraved black letters on light contrasting background color.
- C. Metal Tags: Brass with stamped letters; tag size minimum 2-inch diameter with smooth edges and brass chain.
- D. Stencils: With clean cut symbols and letters; identified as indicated below, including direction of flow:

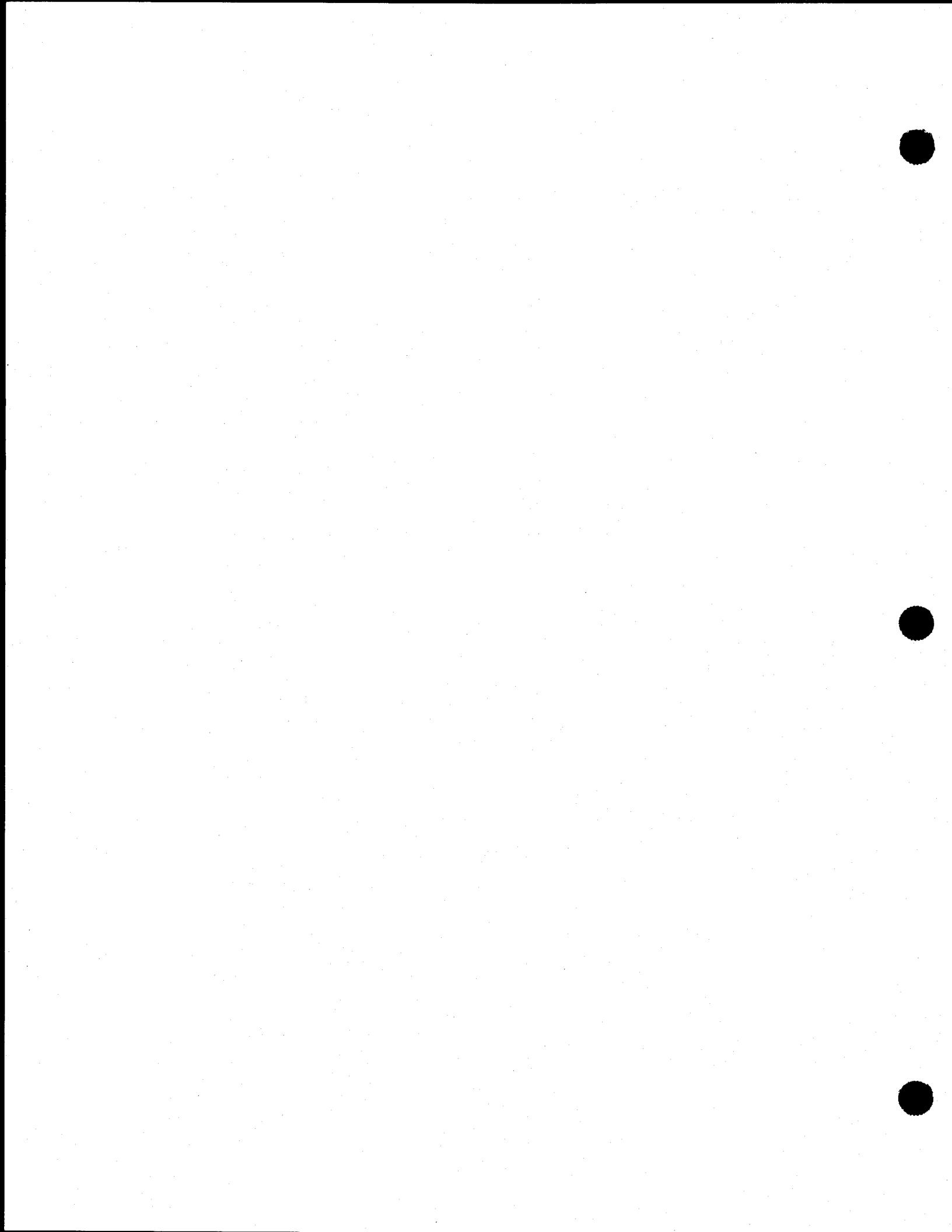
Refrigerant Suction Line	R.S.
Refrigerant Liquid Line	R.L.

PART 3: EXECUTION

3.1 INSTALLATION

- A. Plastic Nameplates: Install with corrosive-resistant mechanical fasteners or adhesive.
- B. Metal Tags: Install with brass chain.
- C. Equipment: Identify air handling units with plastic nameplates.
- D. Controls: Identify control panels and major control components outside panels with plastic nameplates.
- E. Ductwork: Identify ductwork with stenciled painting. Identify as to air handling unit number and area served. Locate identification at air handling unit at each side of penetration of structure or enclosure and at each obstruction.

“END OF SECTION”



**SECTION 23 05 93
TESTING, ADJUSTING AND BALANCING**

PART 1: GENERAL

1.1 SECTION INCLUDES

- A. Testing, adjustment and balancing of air systems.
- B. Measurement of final operating condition of HVAC systems.

1.2 REFERENCES

- A. AABC - National Standards for Field Measurement and Instrumentations, Total System Balance.
- B. NEBB – Procedural Standards for Testing, Adjusting and Balancing of Environmental Systems.

1.3 SUBMITTALS

- A. Submit name of adjusting and balancing agency for approval within 30 days after award of Contract.
- B. Submit test reports.
- C. Provide reports 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.

1.4 QUALITY ASSURANCE

- A. Agency shall be company specializing in the adjusting and balancing of systems specified in this Section with minimum three years experience. Perform Work under supervision of AABC or NEBB Certified Test and Balance Engineer.
- B. Total system balance shall be performed in accordance with AABC "National Standards for Field Measurement and Instrumentation, Total System Balance" or NEBB "Procedural Standards for Testing, Adjusting and Balancing of Environmental Systems".
- C. Provide a Quality Assurance Program to assure Owner and specify design progression that the testing, adjusting and balancing will perform in accordance with the current applicable NEBB Procedural Standards, or equivalent by AABC. Program shall remain in effect or 12 months after submission of the "Final" balance report to the specifying design firm.

PART 3: EXECUTION

3.1 EXAMINATION

- A. Before commencing work, verify that systems are complete and operable.
- B. Report any defects or deficiencies noted during performance of services to the Engineer.

- C. Promptly report abnormal conditions in mechanical systems or conditions, which prevent system balance.
- D. If, for design reasons, system cannot be properly balanced, report as soon as observed.
- E. Beginning of work means acceptance of existing conditions.

3.4 ADJUSTING

- A. Recorded data shall represent actually measured or observed condition.
- B. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
- C. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
- D. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes and restoring thermostats to specified settings.
- E. At final inspection, recheck random selections of data recorded in report. Recheck points or areas as selected and witnessed by the Architect.

3.5 AIR SYSTEM PROCEDURE

- A. Adjust distribution systems to provide required or design supply, return and exhaust air quantities.
- 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. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.

"END OF SECTION"

**SECTION 23 07 13
DUCTWORK INSULATION**

PART 1: GENERAL

1.1 WORK INCLUDED

- A. Ductwork insulation.
- B. Insulation jackets.

1.2 QUALITY ASSURANCE

- A. Applicator: Company specializing in ductwork insulation application with five years minimum experience.
- B. Materials: UL listed; flame spread/fuel contributed/smoke developed rating of 25/50/50 in accordance with ASTM E84.
- C. Compliance: All insulating material shall meet the minimum requirements of California Energy Commission's latest Energy Efficiency Standards or California Mechanical Code, whichever is higher level, but not less than that specified in this section.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Include product description, list of materials and thickness for each service, and locations.
- C. Submit manufacturer's installation instructions.

PART 2: PRODUCTS

2.1 APPROVED MANUFACTURERS - INSULATION

- A. Knauf Fiberglass.
- B. Owens Corning Fiberglas.
- C. Certainteed Products Co.
- D. Thermal Ceramics Fire Master.
- E. JOhnsMansville.

2.2 MATERIALS

- A. Type A: Minimum 1-1/2" thick and 0.75 lb/cu.ft. minimum density. Flexible glass fiber; ASTM C612; commercial grade; with installed thermal resistance of 4.2. Vapor barrier material with a perm rating not exceeding 0.5 perm.

- B. Type D - Vapor Barrier Jacket: Kraft Paper reinforced with glass fiber yarn and bonded to aluminum film.
- C. Type E - Jacket: 8 oz. canvas finished with lagging adhesive.
- D. Adhesives: Waterproof fire-retardant type.
- E. Lagging Adhesive: Fire resistive to ASTM E84.
- F. Impale Anchors: Galvanized steel, 12 gage, and self-adhesive pad.
- G. Joint Tape: Glass fiber cloth, open mesh.
- H. Tie Wire: Annealed steel, 16 gage.

PART 3: EXECUTION

3.1 PREPARATION

- A. Install materials after ductwork has been tested and approved.
- B. Clean surfaces for adhesives.

3.2 INSTALLATION

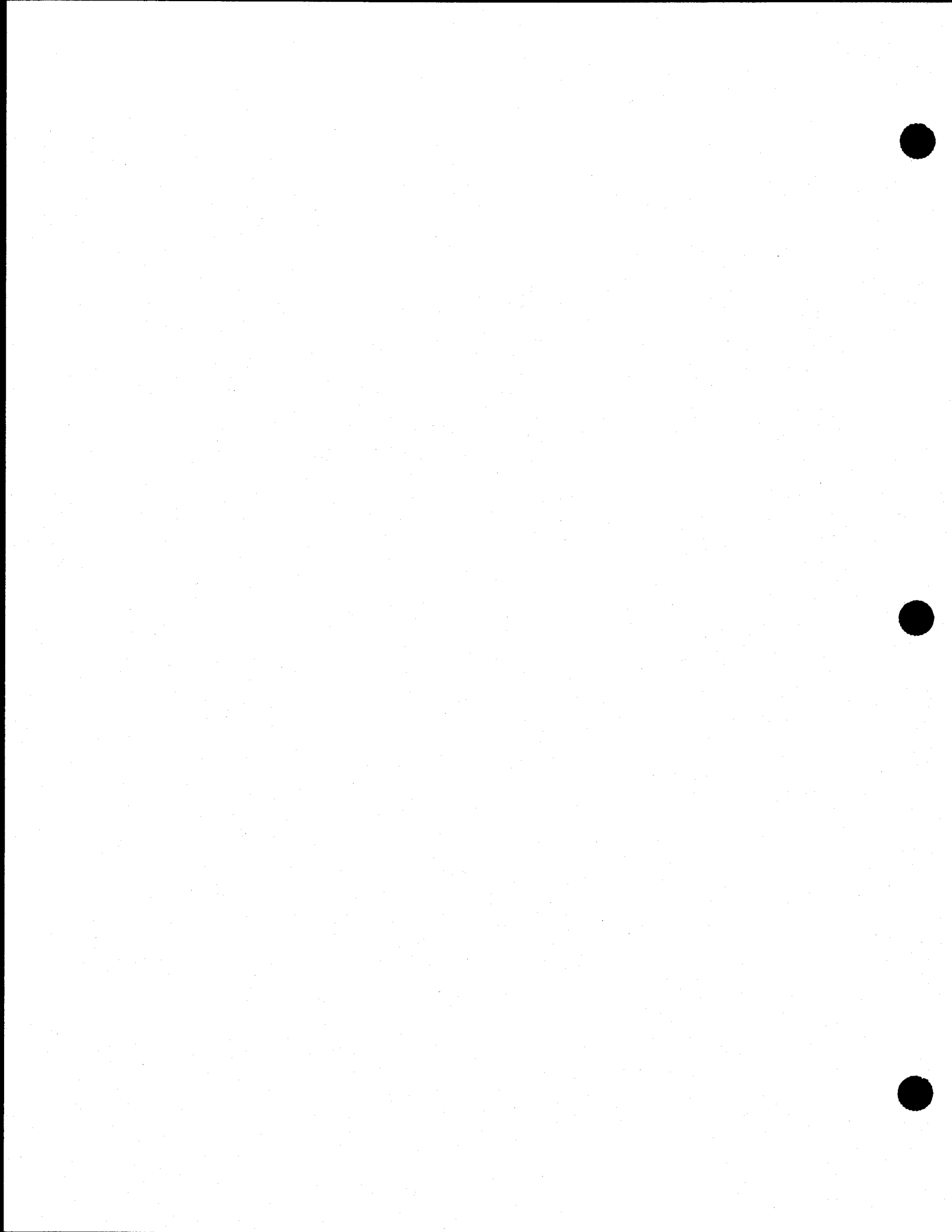
- A. Install materials in accordance with manufacturer's instructions.
- B. Provide insulation with vapor barrier when air conveyed may be below summer ambient temperature.
- C. Exterior Insulation Concealed Application:
 - 1. Adhere insulation to duct with spot application of fire retardant adhesive in sufficient quantities to prevent sagging.
 - 2. Insulation shall be butted with facing overlapping all joints at least 2" and sealed with fire retardant vapor barrier adhesive.
 - 3. Secure insulation with 18 gauge corrosion resistant wire spaced on 12" centers or secured with outward clinch corrosion resistant staples on 4" center.
 - 4. Duct with a width over 30" shall be further secured on the underside with mechanical fasteners on 18" maximum center.
 - 5. Seal all breaks and punctures with vapor barrier tape and same type of fire retardant adhesive.
 - 6. All transverse and longitudinal joints, seams and penetrations of the vapor barrier facing shall be covered with 4 oz. canvas stripping tape applied and sealer with fire retardant mastic.

3.3 SCHEDULE

INSULATION

<u>DUCTWORK</u>	<u>TYPE</u>	<u>THICKNESS - INCH</u>
• Concealed Supply Ducts	A,D	1-1/2"
• Concealed Return Duct	A,D	1-1/2"
• Supply and Return Ducts, Exposed in the Building	B	1-1/2"
• Supply and Return Ducts, Exposed to Atmosphere	C	2"
• Duct Liner for Exhaust Ducts	C	1"
• Duct Liner for Supply & Return Duct (Interior)	C	1"
• Duct Liner for Supply & Return Duct (Exterior)	C	2"

"END OF SECTION"



**SECTION 23 07 19
HVAC PIPING INSULATION**

PART 1: GENERAL

1.1 WORK INCLUDED

- A. Refrigerant piping insulation.
- B. Jackets and accessories.

1.2 QUALITY ASSURANCE

- A. Materials: Flame spread smoke developed rating of 25-50 in accordance with ASTM E84.
- B. Compliance: All insulating material shall meet the minimum requirements of California Energy Commission's Latest Energy Efficiency Standards.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Include product description, list of materials and thickness for each service, and locations.
- C. Submit manufacturer's installation instructions.
- D. Providing work under this section shall be company licensed by the State as an insulation contractor.

PART 2: PRODUCTS

2.1 APPROVED MANUFACTURERS

- A. Refrigerant Piping Insulation:
 - 1. Armaflex 520
 - 2. Halstead Insul-Tube
 - 3. Rubatex

2.2 INSULATION

- A. Material: Flexible foamed pipe insulation.

2.3 JACKETS

- A. Exterior Applications:
 - 1. Aluminum Vapor Barrier Jackets: ASTM B209; 0.020 inch thick; smooth finish.

2.4 ACCESSORIES

- A. Refrigerant Pipe Insulation Exterior Finish: WB Armaflex finish by Armstrong or Rubatex Protective Coating 67 x 944.

PART 3: EXECUTION

3.1 PREPARATION

- A. Install materials after piping has been tested and approved.
- B. Refrigerant Piping Insulation:
 - 1. For condensing units, install insulation on above ground refrigerant suction piping and fittings, including thermal bulb, from thermal expansion valve. For split system heat pump units, install insulation on above ground refrigerant liquid and suction piping and fittings. Install insulation on above ground hot gas bypass lines.
 - 2. Install insulation in snug contact with pipe and in accordance with Manufacturer's recommendations:
 - a. Insulate flexible pipe connectors.
 - b. Insulate thermal expansion valves with insulating tape.
 - c. Insulate fittings with sheet insulation and as recommended by Manufacturer.
 - 3. Slip insulation on tubing before tubing sections and fittings are assembled keeping slitting of insulation to a minimum.
 - 4. Install insulation on lines through clamp assembly of pipe support. Do not butt insulation up against sides of clamp assembly. Install sleeve around insulation at each clamping location to prevent crushing of insulation when clamp is tightened.
 - 5. Stagger joints on layered insulation. Seal joints in insulation.
 - 6. Install insulation exposed outside building so "slit" joint seams are placed on bottom of pipe.
 - 7. Paint exterior exposed insulation with two coats of specified exterior finish.

3.3 SCHEDULE OF INSULATION THICKNESS

Insulation thickness and conductivity shall be as required by the latest California Energy Commission Standards but not less than that indicated in the table below:

"END OF SECTION"

**SECTION 23 31 00
DUCTWORK**

PART 1: GENERAL

1.1 WORK INCLUDED

- A. 2.0" pressure class ducts.

1.2 DEFINITIONS

- A. Duct Sizes: Inside clear dimensions.
- B. Pressure-Velocity Classification: Duct construction pressure classification shall comply with SMACNA HVAC Duct Construction Standards.

1.3 REGULATORY REQUIREMENTS

- A. Duct system shall be constructed, installed, sealed and insulated as provided in Chapter 6 of the California Mechanical Code.
- B. Construct ductwork to NFPA 90A and NFPA 90B and NFPA 96 standards.

1.4 SUBMITTALS

- A. Submit duct drawings.
- B. Indicate duct fittings, particulars such as gages, sizes, welds and configuration prior to start of work for air distribution, kitchen hood exhaust, glass fiber duct systems as applies.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site.
- B. Store and protect products.

PART 2: PRODUCTS

2.1 APPROVED MANUFACTURERS - FOR FLEXIBLE DUCTS

- A. Casco flexible duct.
- B. Thermaflex flexible duct.

2.2 MATERIALS

- A. Steel Ducts: ASTM A525 or ASTM A527 galvanized steel sheet, lock-forming quality, having zinc coating of 1.25 oz per sq ft for each side in conformance with ASTM A90.
- B. Hanger Rod: Steel, galvanized; threaded both ends, threaded one end or continuously threaded.

2.3 2.0" PRESSURE DUCTWORK

- A. Fabricate and support in accordance with SMACNA Pressure Duct Construction Standards for 2.0" pressure classification and ASHRAE handbooks, except as indicated. Provide duct material, gages, reinforcing and sealing for operating pressures indicated.
- B. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts. The Contractor has the option to use equivalent round or rectangular of equivalent sizes.
- C. 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 are used, provide [air foil] turning vanes. Where acoustical lining is indicated, provide turning vanes of perforated metal with glass fiber insulation.
- D. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible. Divergence upstream of equipment shall not exceed 30 degrees; convergence downstream shall not exceed 45 degrees.
- E. Provide easements where ductwork conflicts with piping and structure. Where easements exceed 10 percent duct area, split into two ducts maintaining original duct area.
- F. Connect flexible ducts to metal ducts with adhesive plus sheet metal screws.
- G. Use crimp joints with or without bead for joining round duct sizes 12 inch and smaller with crimp in direction of airflow.
- H. Use double nuts and lock washers on threaded rod supports.

PART 3: EXECUTION

3.1 INSTALLATION

- A. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide pitot 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.

"END OF SECTION"

**SECTION 23 33 00
DUCTWORK ACCESSORIES**

PART 1: GENERAL

1.1 WORK INCLUDED

- A. Volume control dampers.
- B. Fire dampers.
- C. Combination fire and smoke dampers.
- D. Back draft dampers.
- E. Air turning devices.
- F. Flexible duct connections.
- G. Duct access doors.
- H. Duct test holes.
- I. Cable controls systems and volume dampers.

1.2 SUBMITTALS

- A. Submit cut sheet.
- B. Provide shop drawings for shop-fabricated assemblies indicated, including volume control dampers, duct access doors, and duct test holes. Provide product data for hardware used.
- C. Submit manufacturer's installation instructions for fire dampers and combination fire and smoke dampers where required on the drawings.

PART 2: PRODUCTS

2.1 VOLUME CONTROL DAMPERS

- A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards for pressure classification, in which it will be installed.
- B. Fabricate splitter dampers of material same gage as duct to 24 inches size in either direction and two gages heavier for sizes over 24 inches.

- C. Fabricate splitter dampers of double thickness sheet metal to streamline shape. Secure blade with continuous hinge or rod. Operate with minimum 1/4-inch diameter rod in self-aligning, universal joint action flanged bushing with setscrew.
- D. Fabricate single blade dampers for duct sizes to 9-1/2 x 30 inch.
- E. Fabricate multi-blade damper of opposed blade pattern with maximum blade sizes 12 x 72 inch. Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.
- F. Except in round ductwork 12 inches and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon or sintered bronze bearings.
- G. Provide locking, indicating quadrant regulators on single and multi-blade dampers. [Where rod lengths exceed 30 inches provide regulator at both ends.]
- H. On insulated ducts mount quadrant regulators on standoff mounting brackets, bases or adapters.

2.2 APPROVED MANUFACTURERS - AIR TURNING DEVICES

- A. Duro Dyne.
- B. Elgin.
- C. or equal.

2.3 AIR TURNING DEVICES

- A. Multi-blade device with blades aligned in short dimension; steel or aluminum construction; with individually adjustable blades, mounting straps.

2.4 APPROVED MANUFACTURERS - FLEXIBLE DUCT CONNECTIONS

- A. Duro-Dyne.
- B. Elgin.
- C. or equal.

2.5 FLEXIBLE DUCT CONNECTIONS

- A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards and as indicated.
- B. UL listed fire-retardant neoprene coated woven glass fiber fabric to NFPA 90A, minimum density 20 oz per sq yd, approximately 6 inches wide, crimped into metal edging strip.
- C. Leaded vinyl sheet, minimum 0.55 inch thick, 0.87 lbs per sq ft, 10 dB attenuation in 10 to 10,000 Hz range.

2.6 APPROVED MANUFACTURERS - DUCT ACCESS DOORS

- A. California Aire.

- B. Ruskin.
- C. Pottorff.

2.7 DUCT ACCESS DOORS

- A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards suitable for pressure classification in which it will be installed.
- B. Review locations prior to fabrication.
- C. Fabricate rigid and close-fitting doors of galvanized steel with sealing gaskets and quick fastening locking devices. For insulated ductwork, install minimum one-inch thick insulation with sheet metal cover.
- D. Access doors smaller than 12 inches square may be secured with sash locks.
- E. Provide two hinges and two sash locks for sizes up to 18 inches square, three hinges and two compression latches with outside and inside handles for sizes up to 24 x 48 inches. Provide an additional hinge for larger sizes.
- F. Access doors with sheet metal screw fasteners are not approved.

PART 3: EXECUTION

3.1 INSTALLATION

- A. Install accessories in accordance with manufacturer's instructions.
- B. Provide balancing dampers at points on supply, return and exhaust systems where branches are taken from larger ducts as required for air balancing. Use splitter dampers only where indicated.
- C. Provide flexible connections immediately adjacent to equipment in ducts associated with fans and motorized equipment. Cover connections to medium and high pressure fans with leaded vinyl sheet, held in place with metal straps. Flexible connections shall have a minimum of 1" slack in fabric material with a minimum space of 1-1/2" between metal edging strips.
- D. Provide duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, at fire dampers, and elsewhere as indicated. Provide minimum 8 x 8 inch size for hand access, 18 x 18 inch size for shoulder access, and as indicated.
- E. Provide duct test holes where indicated and required for testing and balancing purposes.

"END OF SECTION"



**SECTION 23 37 00
AIR OUTLETS AND INLETS**

PART 1: GENERAL

1.1 WORK INCLUDED

- A. Registers/grilles.

1.2 REFERENCES

- A. ANSI/NFPA 90A - Installation of Air Conditioning and Ventilating Systems.
- B. SMACNA - HVAC Duct Construction Standard.

1.3 SUBMITTALS

- A. Provide product data for items required for this project.

PART 2: PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. E.H.Price
- B. Anemostat
- D. Titus

2.2 CEILING AND WALL SUPPLY AND RETURN REGISTERS/GRILLES

- A. Streamlined blades, depth of which exceeds 3/4 inch spacing with spring or other device to set blades, manufactured by E.H.Price.
- B. Ceiling Return and Exhaust Registers and Grilles: E.H.Price all aluminum (or in steel) with baked off-white enamel over prime coat construction with opposed blade gang-operated volume control. Cores shall be without indents. Where located in tee ceilings provide with 24 x 24 extended shell or perforated panel as shown on drawing. Verify frame types with Architect before ordering.
- C. Frame type shall be compatible with ceiling.
- D. Fabricate of steel or aluminum with baked enamel finish, color as specified by Architect.
- E. Where not individually connected to exhaust fans, provide integral, gang-operated opposed blade dampers with removable key operator, operable from face.

PART 3: EXECUTION

3.1 INSTALLATION

- A. Install items in accordance with manufacturers' 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 to ductwork with airtight connection.
- D. Provide balancing dampers on duct take-off to, grilles and registers, regardless of 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.

"END OF SECTION"

**SECTION 23 81 23
DUCTLESS SPLIT SYSTEMS**

PART 1: GENERAL

1.1 QUALITY ASSURANCE

Requirements of Regulatory Agencies: Each unit shall be UL labeled.

1.2 WARRANTY

Five year warranty on compressors, warranty certificate with expiration date shall be given to Owner after equipment start-up.

PART 2: PRODUCTS

2.1 DUCTLESS SPLIT SYSTEM AIR CONDITIONING UNIT

- A. The system shall consist of a slim silhouette wall mounted evaporator section and matching outdoor condensing unit. a complete charge of refrigerant 410a for 25 feet of tubing shall be provided in the condensing unit.
- B. The evaporator fan shall be a forward curved, line flow, direct drive type, statically and dynamically balanced with permanently lubricated bearings.
- C. The condensing unit shall have a direct drive propeller fan arranged for horizontal discharge. the casing shall be fabricated of galvanized steel, bonderized and finished with baked enamel. the refrigeration system shall have the capability to operate with a maximum height difference and an overall tubing length as described in the schedule. refrigerant flow from the condenser shall be controlled by a capillary tube.
- D. The control system shall consist of two microprocessor sections. one shall be factory wired and located within the indoor unit. the microprocessor within the remote monitor shall display the set point.
- E. Units shall be manufactured by Sanyo, Mitsubishi or approved equal.

2.2 CONDENSING UNIT

- A. Condensing units shall have a seasonal energy efficiency rating (seer) of at least 13 when matched with the fan coil units described above, refrigerant shall be R-410. units shall be Sanyo, carrier, or Mitsubishi.

PART 3: EXECUTION

3.1 FIELD QUALITY CONTROL

Condensing units shall be started up, checked out, and adjusted by Condensing Unit Manufacturer's authorized factory trained service mechanic.

3.2 INSTALLATION

- A. Install equipment as shown on the drawings and in compliance with the manufacturer's recommendations, complete with refrigerant piping, control wiring, vibration isolation, mounting pads or foundations, and flexible connectors, refrigerant piping and piping accessories as required.
- B. Inspect the areas under which work of this section will be performed. Correct conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected.

3.3 EQUIPMENT FOUNDATIONS

- A. Equipment foundations, where indicated, shall be of sufficient size and weight, and of proper design to preclude shifting of equipment under operating conditions, or under any abnormal conditions, which could be imposed upon the equipment. Foundations shall meet the requirements of the equipment manufacturer, and when required by the Architect, the Contractor shall obtain from the equipment manufacturer approval of the foundation design and construction for the equipment involved. Equipment vibration shall be maintained within design limits, and shall be dampened and isolated.

3.4 FIELD TESTS AND INSPECTION

- A. General: Perform all field investigations, field tests, and trial operations as specified in Section 15010. Provide all labor, equipment and incidentals required for the testing.
- B. Equipment and Material: Equipment and material certified as having been successfully tested by the manufacturer in accordance with referenced specifications and standards will not require retesting before installation. Equipment and materials not tested at the place of manufacture will be tested before or after installation, as applicable, or necessary to determine compliance with reference specifications and standards.
- C. Start-Up and Operational Test: The system shall be started up and initially operated with all components operating. Adjust safety and automatic control instruments as necessary to place them in proper operation and sequence.
- D. Extent of Field Tests: After installation and before acceptance, the work of this Section shall be subjected to all necessary field tests, including those specified, here and in Section 15010.
- E. Operation and Maintenance Data: Provide required operation and maintenance data as specified in Section 15010.

"END OF SECTION"

**SECTION 26 00 05
ELECTRICAL DEMOLITION**

Part 1 - GENERAL

1.01 SCOPE

- A. Work Included: All labor, materials, appliances, tools, equipment, facilities, transportation and services necessary for and incidental to performing all operations in connection with furnishing, delivery and installation of the work of this Section, complete, as shown on the drawings and/or specified herein. Work includes, but is not necessarily limited to, the following:
1. Examine all other sections for work related to those other sections and required to be included as work under this section.
 2. General provisions and requirements for electrical work.

1.02 GENERAL SUMMARY OF ELECTRICAL WORK

- A. Refer to the drawings of other trades for additional details which affect the proper installation of this work. Diagrams and symbols showing electrical connections are diagrammatic only. Wiring diagrams do not necessarily show the exact physical arrangement of the equipment.
- B. Before submitting a bid, the Contractor shall familiarize himself with all features of the building drawings and site drawings which may affect the execution of the work. No extra payment will be allowed for failure to obtain this information.
- C. If there are omissions or conflicts between the drawings and specifications, clarify these points with the Architect before submitting bid.

1.03 LOCATIONS OF EQUIPMENT

- A. The drawings indicate diagrammatically the existing locations or arrangement of outlets, equipment, lighting, etc., and are to be followed as closely as possible. Proper judgment must be exercised in executing the work so as to secure the best possible removal of equipment and to overcome local difficulties due to space limitations or interference of structure conditions encountered.
- B. The locations of existing utilities, building, equipment shown on the drawings to approximate. Verify exact locations and routing of existing systems in the field.
- C. Coordinate and cooperate in every way with other trades in order to avoid interference and assure a satisfactory job.

1.04 PERMITS

- A. Take out and pay for all required permits, inspections and examinations without additional cost to the Owner.

1.05 QUALITY ASSURANCE

- A. Work and materials in full accordance with the latest rules and regulations of the California Administrative Code Title 24, Part 3 "Basic Electrical Regulations", Title 8

"Division of Industrial Safety", the National Electrical Code, the National Life Safety Code, and other applicable state laws and regulations.

- B. Keep a copy of all applicable codes available at the job site at all times while performing work under this section. Nothing in plans or specifications shall be construed to permit work not conforming to the most stringent of codes.

1.06 JOB CONDITIONS - PROTECTION

- A. Protect all work, materials and equipment from damage from any cause whatever and provide adequate and proper storage facilities during the progress of the demolitions work. Provide for the safety and good condition of all the work until final acceptance of the work by the Owner.

1.07 TEMPORARY ELECTRICAL POWER

- A. The Contractor shall provide his own temporary construction lighting and power as required in areas where work is being performed, when normal site power is disrupted. Temporary power arrangements, outages, installation, work schedules, etc., shall be submitted in writing three weeks prior to requested outage date, and approved by the Owner prior to start of work.

1.08 POWER, LIGHTING, SECURITY CAMERA DEMOLITION

- A. Remove all existing lighting fixtures with related conduit and wiring to source. Store lighting fixtures in a secure storage area, coordinate with the facilities project manager.
- B. Provide security camera demolition as required. Refer to demolition drawings for locations and extent of demolition required contractor shall visit site prior to bid to determine extent of work involved.
- C. Set up a storage area to house all removed and salvage materials. Storage area must be coordinated with facilities project manager.
- D. Contractor shall remove all equipment along with related conduit and wiring back to source.
- E. Contractor shall remove all security camera outlet boxes, terminal boards etc. with related cabling back to source, and remove from site.
- F. Main switchboard along with utility transformer pad shall be maintained during demolition construction. At no time shall the normal and/or emergency power be de-energized for the facility.
- G. Contractor shall coordinate with the County all materials to be disposed of and all equipment to be salvaged and returned back to the EDA County Maintenance.

END OF SECTION

SECTION 26 05 00
BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. This Section provides the Basic Electrical Requirements which supplement the General Requirements of Division 01 and apply to all Sections in Division 26.

1.02 BASIC ELECTRICAL REQUIREMENTS

A. Drawings and Specifications Coordination:

1. For purposes of clearness and legibility, the Electrical Drawings are essentially diagrammatic. The size and location of equipment is indicated to scale whenever possible. Contractor shall verify all conditions, data and information as indicated on Drawings and in Specifications Sections where Electrical work is required.
2. The Electrical Drawings indicate required size and points of termination of conduits, number and size of wires, and suggest proper route for conduit. It shall be responsibility of Contractor to install conduits with minimum number of bends to conform to structure, avoid obstructions, preserve headroom, keep openings and passageways clear, and meet all applicable code requirements. Routing of conduits may be changed, if approved by the District Electrical Inspector, provided that the length of any conduit run is not increased or decreased more than 10% of the length indicated on Drawings.
3. It is intended that outlets be located symmetrical with Architectural elements notwithstanding fact that locations indicated on Drawings may be distorted for clarity.
4. The Architectural Drawings take precedence over the Electrical Drawings in the representation of general construction work. Drawings of the various trades take precedence in representation of work of those trades. Contractor shall refer to all Drawings to coordinate the Electrical work with work of other trades.

B. Terminology:

1. Term "signal system" shall apply to clock, bell, fire alarm, annunciator, sound, public address, buzzer, public telephone, television, inter-communication, and security systems.
2. Term "low voltage" shall apply to systems operating at 600 volts and under.
3. Term "provide" used on Drawings and elsewhere in the Specifications shall be considered to mean "furnish and install".
4. Term "UL" means Underwriters Laboratories Inc.

C. Ordinances and Regulations:

1. Electrical work shall meet requirements of local authorities having jurisdiction including municipal ordinances, City Building code, the California Code of Regulations, Title 24, the Safety Orders of the State Division of Industrial Safety, and the Fire and Panic Safety Standards of the State Fire Marshal. Material and

labor shall conform to Regulations of the National Board of Fire Underwriters for Electrical Wiring and Apparatus. All new material shall be "UL" listed or shall be listed by the City of Los Angeles, including amendments thereto, effective on date of openings bids for work, is hereby made a part of this Specification, and shall apply to all work both within and outside the City of Los Angeles, except for those portions which conflict with requirements of local authorities.

2. Electrical work shall meet requirements of latest California Electrical Code as indicated and specified.

D. Structural Considerations for Conduit Routing:

1. Where conduits are to pass through or will interfere with any Structural member, or where notching, boring or cutting of the structure is necessary, or where special openings are required through walls, floors, footings, or other buildings elements, to accommodate the electrical work, such work shall conform to State Building Code, Part 2, Title 24, Section 2606 for conduits and pipes embedded in concrete and Section 2517 (g) 8, 9, for notches and bored holes in wood; for steel, as detailed on the Structural Drawings.
2. Where a concrete encasement for underground conduit abuts a foundation wall or underground structure which the conduits enter, encasement shall, rest on a haunch integral with wall or structure, or shall extend down to footing projection, if any, or shall be doweled into structure unless otherwise indicated. Underground structures shall include manholes, pull boxes, vaults and buildings.
3. Holes required for conduit entrances into poles, shall be drilled and conduit nipple or coupling shall be welded to poles. Welds shall be by the electric arc process and shall be continuous around nipple or coupling.

E. Electrically Operated Equipment and Appliances:

1. Equipment and Appliances Furnished by Contractor:
 - a. The Electrical work shall include furnishing and installing wiring enclosures for, and the complete connection of all electrically operated equipment and appliances and any electrical control devices which are specified to be furnished and installed in this or other Electrical Sections of these Specifications, except Electrical work specified or indicated to be in the Mechanical work. All wiring enclosures shall be installed concealed except where exposed work is indicated on Electrical Drawings.
 - b. Connections shall be made as necessary to completely install equipment ready for use. Equipment shall be tested for proper operation and, if motorized, for proper rotation. If outlets of incorrect Electrical characteristics or if any equipment fails to operate properly, Contractor shall report to the District Inspector in writing, listing buildings and rooms in which located, the name, make and serial number of equipment, and a description of defect.
2. Equipment and Appliances Furnished by Others:
 - a. Equipment and appliances indicated on Drawings as N.I.C. (Not in Contract), "Furnished by Others", will be delivered to the Site. Required Electrical connections shall be made for all such equipment and

appliances in accordance with accepted trade practices under direction of the Electrical Engineer. All motorized equipment will be furnished factory wired to a control panel or junction box unless otherwise indicated. Appliances will be furnished equipped with portable cord and cap. Provide disconnect switches where required.

- b. Connections to equipment furnished under other Sections of this Specification shall be part of the Electrical Work. Work shall include internal wiring, installation, connection and adjustment of bolted drive motors in which the motor is supplied as a separate unit and connections only for equipment furnished with factory installed internal wiring, except as further limited by Drawings and other Sections of this Specification. Work shall include furnishing and installing suitable outlets, disconnecting devices, starters, push button stations, selector switches, conduit, junction boxes, and wiring necessary for a complete Electrical installation. Work shall also include furnishing and installing conduit and outlet box, if needed for control system, furnished under Mechanical. Devices and equipment furnished shall be of same type used elsewhere on job or as specified.
- c. Electrical equipment furnished under other Sections of this Specification for installation and connection under work of this Section shall be delivered to the installation location by the Contractor furnishing the equipment.
- d. Mechanical equipment furnished under other Sections of this Specification, and requiring Electrical connection under this Section, will be set in place by Contractor furnishing equipment.
- e. Suitability and condition of equipment furnished by other Sections of this Specification shall be determined in advance of installation. Immediate notice of damage, unsuitability or lack of parts shall be given to the Architect.

F. Protection of materials

- 1. Provide for safety and good condition of all materials and equipment until final acceptance of project by the Owner. Protect all materials and equipment from damage and provide adequate and proper storage facilities during progress of work. All damaged and defective work shall be replaced prior to final inspection.

G. Cleaning

- 1. Exposed parts of Electrical work shall be left in a neat, clean, usable condition. Finished painted surfaces shall be unblemished and metal surfaces shall be polished.
- 2. Thoroughly clean all parts of apparatus and equipment. Exposed parts which are to be painted shall be thoroughly cleaned of cement, plaster and other materials. Remove grease and oil spots with solvent. Such surfaces shall be wiped and all corners and cracks scraped out. Exposed rough metal work shall be smooth, free of sharp edges, carefully steel brushed to remove rust and other spots, and left in proper condition to receive finish painting.
- 3. Contractor shall remove from the Site all debris and rubbish caused by the Electrical work. He shall thoroughly clean building of dirt, debris, rubbish, marks,

etc., caused by performance of work.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 INSTALLATION OF EQUIPMENT AND APPLIANCES

- A. Conduit stubs for equipment shall be terminated in a coupling flush with finished floor and shall be extended with rigid metallic conduit to a motor starter or junction box on the equipment.
- B. If connection is from a flush wall-mounted junction box, install a weatherproof universal box extension and adaptor by Bell Electric Company, and extend with rigid metallic conduit to motor starter or junction box on equipment.
- C. All exposed final connections to equipment shall be by a water tight flexible conduit, unless otherwise indicated. A maximum of 36" of flexible conduit may be used except that all extensions from flush floor couplings shall be rigid conduit to a distance not less than 6" above floor.
- D. Flexible conduit for all motors, shop and cafeteria equipment and other equipment, including HVAC equipment, shall be liquid-tight, flexible conduit, and shall contain a code size insulated green bond wire.
- E. All exposed conduit shall be run vertically and horizontally following general configuration of the equipment, using cast threaded hub conduit fittings where required and shall be clamped to equipment with suitable iron brackets and one hole pipe straps.
- F. Connectors for flexible steel conduit shall be the type which threads into convolutions of conduit. Connectors for water-tight flexible metal conduit shall be approved for such use and shall be installed to make a watertight connection.

3.02 CLOSE OUT OF PROJECT

- A. Contractor shall provide the following items at the end of the project:
 - 1. As-built drawings on AutoCAD R.14 or 2002 on disk with one (1) set of prints.
 - 2. Ground fault test report.
 - 3. Five (5) sets of all warranty information with fixture cuts of equipment in a book.

END OF SECTION

**SECTION 26 05 05
BASIC ELECTRICAL MATERIALS**

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Boxes, Enclosures, Keys and Locks.
- B. Receptacles and Switches.
- C. Identifications and Signs.

1.02 RELATED SECTIONS

- A. Basic Electrical Requirements: Section 26 05 00.

1.03 SUBMITTALS

- A. Submit in accordance with Section 01 33 00: Submittals.

PART 2 - PRODUCTS

2.01 BOXES, ENCLOSURES, KEYS AND LOCKS

A. Outlet Boxes and Fittings:

1. Outlet boxes used in concealed work shall be galvanized or sheardized steel, pressed or welded type, with knockouts.
2. In exposed work, outlet boxes and conduit fittings required where conduit runs change direction or size, shall be cast metal with threaded cast hubs cast integral with box or fitting. Boxes and fittings shall not have unused spare hubs except as otherwise indicated or specified.
3. Fittings shall be cast metal and non-corrosive. Ferrous metal fittings shall be cadmium plated or zinc galvanized. Castings shall be true to pattern, smooth, straight, with even edges and corners, of uniform thickness of metal, and shall be free of cracks, gas holes, flaws, excessive shrinkage and burnt-out sand.
4. Covers for fittings shall be galvanized steel or non-corrosive aluminum and shall be designed for particular fitting used.
5. Light fixture outlets shall be 4" octagon, 4" square, or larger, depending upon number of wires or conduits therein, and shall be equipped with 3/8" malleable iron fixture studs, and plaster rings. Plaster rings shall have round opening with 2 ears drilled 2-23/32" center to center.
6. For local switch outlets use 4" square boxes for single gang, 5" square boxes for two-gang, and special solid gang boxes with gang plaster ring for more than 2 switches.
7. For all receptacle, clock, bell, fire station, speaker, thermostat and telephone outlets, use 4" square boxes or larger, if necessary, with single gang plaster rings. For television outlets, use 4-gang deep boxes and 4-gang plaster rings. For buzzer, communication switch, and handset outlets, use 4" square boxes with

- single gang or larger plaster rings.
8. Plaster rings shall be provided on all flush mounted outlet boxes except where otherwise indicated or specified. All plaster rings shall be same depth as finished surface.
 9. In existing plywood wall or drywall construction, and where flexible steel conduit is fished into walls, one-gang and two-gang outlets for wiring devices may be sectional steel boxes with plaster ears. Boxes shall be fastened to plywood with a flat head screw in each plaster ear screw hole. Boxes fastened to gypsum board shall be "Gripsite" by Raco.
 10. Factory made knock-out seals shall be installed to seal all box knock-outs which are not intact.
 11. At each location where flexible conduit is extended from a flush outlet box, provide and install a weatherproof universal box extension adapter by Bell Electric Company.

B. Junction and Pull-Boxes:

1. Junction and pull-boxes, in addition to those indicated, shall only be used where absolutely necessary.
2. Interior and non-weatherproof boxes shall be constructed of blue or galvanized steel with ample laps, spot welded, and shall be rigid under torsional and deflecting forces. Boxes shall have auxiliary angle iron framing where necessary to ensure rigidity. Covers shall be fastened to box with a sufficient number of brass machine screws to ensure continuous contact all around. Flush type boxes shall be drilled and tapped for cover screws at Site if boxes are not installed plumb. All surfaces of pull and junction boxes and covers shall be given one coat of metal primer, and one coat of aluminum paint.
3. Weatherproof pull and junction boxes shall conform to foregoing for interior boxes with following modifications: Cover of flush mounting boxes shall have a weather-tight gasket cemented to and trimmed even with cover all around. Surface or semi-flush mounting pull and junction boxes shall be UL approved as rain-tight and shall be complete with threaded conduit hubs. All exposed portions of boxes shall be galvanized and finished with a prime coat and coat of baked-on grey enamel.
4. All junction and pull-boxes shall be rigidly fastened to the structure and shall not depend on conduits for support.

C. Keys and Locks:

1. Contractor shall provide 2 keys with each door lock furnished, including cabinet door locks, switchboard locks, etc.; and shall provide 2 keys for each lock switch on a switchboard or control panel; and shall provide 2 keys with each interlock or other lock switch furnished. Deliver keys to the Project Manager. Unless otherwise specified, keys shall match existing lock switch.

2.02 RECEPTACLES AND SWITCHES

A. Receptacles:

1. Duplex receptacles with more than one (1) duplex connected to circuit breakers shall be specification grade, 15 amperes, 125 volts, 3 wire, side wired with

binding screws, parallel slots, U-ground, plaster ears and captive mounting screws. Body shall be phenolic, plastic or bakelite. Receptacles shall be heavy duty, 3 blade current carrying contacts and double wide flat blade ground contacts. Receptacles shall be Hubbell, Leviton or approved equal, color shall be per Architect.

2. Duplex receptacles shall be specification grade, grounding type, side wired, with binding screws, receptacles shall have standard size ivory bakelite base. For circuits consisting of one single duplex receptacle only, ampere rating of receptacle shall be the same as circuit breaker or fuse. 15 ampere, 125 volt receptacles shall be NEMA 5-15R, Arrow-Hart. 20 ampere, 125 volt receptacles shall be NEMA 5-20R, Arrow-Hart, color shall be per Architect.
3. Ground fault interrupter type receptacles shall consist of a single receptacle and reset device manufactured in a standard configuration for use with a duplex plate. Receptacles shall be feed-thru, 20 ampere, NEMA 5-20R, white in color and shall be Leviton 6399-I, or equal. Exterior mounted receptacles shall be weatherproof.
4. Weatherproof receptacles shall, except where otherwise indicated or specified, consist of a duplex receptacle as specified herein and a metal plate with die cast hinged lid and weatherproof mat, Arrow-Hart #5252-WP. Weatherproof receptacle shall have a taymal #20510 cover only.

B. Switches:

1. Local Switches:

- a. Local switches shall be tumbler type, specification grade, rated 20 amperes at 120- 277 volts AC only, with plaster ears, binding screws for side wiring, and standard size composition cups which fully enclose the mechanism. Switches shall be approved for use at currents up to the full rating on resistive, inductive, tungsten filament lamp and fluorescent lamp loads, and for up to 80% of the rating for motor loads. Switches shall be single pole, double pole, 3-way, 4-way, non-lock type. Non-lock type switches shall have ivory handles, and switch shall be Hubbell 1221-I single pole, 1222-I double pole, 1223-I 3-way, and 1224-I 4-way. Color shall be per Architect.
- b. All lock type switches shall have metal or nylon key guides with ON/OFF indication, and shall be operable by the same key. Keys for lock type switches shall be forked type, cut from 1/16" stock. Fork dimensions shall be: External 1/4", Internal 5/32", depth 3/16" and radius 5/64". Key switches shall be Hubbell 1221-L single pole, 1222-L double pole, 1223-L three-way, and 1224-L four-way or approved equal. Where pilot light is required for key switch see paragraph on "Pilot Lights". Color shall be per Architect.
- c. Remote control switches for mechanically held contactors arranged for 3-wire control shall be tumbler type, momentary contact, single pole, 3-position with center "OFF", rated 20 amperes at 120-277 volts AC only, with plaster ears, binding screws for side wiring, standard size composition cups which fully enclose mechanism, and ivory handles; Hubbell 1556-I.

2.03 IDENTIFICATION AND SIGNS

A. Name Plates:

1. Following equipment shall be provided with name plates unless otherwise specified: switchboards, motor control centers, control panels, push button stations, time switches, contactors, motor starters, motor switches, lighting panelboards, power panelboards, and terminal cabinets.
2. Following devices shall be provided with circuit call out engraved in plate of device, receptacles and switches.
3. Name plates shall adequately describe function, voltage and phase of particular equipment involved. Where name plates are detailed or described on Drawings, inscription and size of letters shall be as indicated. For lighting and power panels, name plates shall indicate panel designation, voltage and phase of panel. For terminal cabinets, name plates shall indicate system housed therein.
4. Name plates shall be black and white nameplate stock of bakelite with characters cut through black exposing white. Plates shall have beveled edges and shall be securely fastened in place with #4 Phillips head, cadmium plated steel, self-tapping screws. Characters shall be 3/16" high, unless otherwise indicated.

B. Markings:

1. Following equipment and controls shall have markings:
 - a. Surface-mounted starters, switches, disconnect switches, contactors, and other devices controlling motors and appliances. Abbreviations acceptable to the District's Electrical Inspector, along with an identifying number, shall be used. Markings shall be done with locking type stencils using paint of a contrasting color. Figures shall be 3/8" high unless otherwise indicated. Dymo Industries, Inc., self-sticking plastic labels, having embossed characters made with a typewriter, may be used, in lieu of stencils and paint.
2. High Voltage: High voltage switchboards, cabinets, boxes, and conduits exposed in accessible locations, including under buildings and in attics, shall be marked "DANGER-HIGH VOLTAGE". Markings for switchboards shall consist of an #18 gage steel, porcelain enamel sign, of standard manufacture. Markings for boxes, cabinets and conduits shall be by means of stenciling or printed self-adhesive markers, Westline "Tel-A-Pipe". Letters shall be black on orange background and not less than 1-7/8" high. On conduit runs, marking shall be applied at intervals not exceeding 10' in any individual area. Markings shall be done only after other painting has been completed.
3. Where a building or structure is supplied by more than one service, or any combination of branch circuits, feeders, and services, a permanent plaque or directory shall be installed at each service disconnect location denoting all other services, feeders, and branch circuits supplying that building or structure and the area served by each per.
4. Where a building or structure has any combination of branch circuits, feeders, or services passing through it, a permanent plaque or directory shall be installed at each feeder and branch-circuit disconnect location denoting all other services, feeders, and branch circuits passing through that building or structure and the area served by each.

C. Warning Signs:

1. Provide a warning sign on outside of each door or gate to rooms or enclosures containing high voltage equipment. Signs shall read: "DANGER- HIGH VOLTAGE-KEEP OUT". Signs shall be 7" x 14" with all lettering 1" high except word "DANGER" which shall have 1-1/2" high letters.
2. Provide a warning sign on each high voltage non-load break disconnect and fused cutout (not oil filled). Signs shall read: "DO NOT OPEN UNDER LOAD". Lettering shall be 1" high.
3. Signs shall be of standard manufacture #18 gage steel, with porcelain enamel finish. Letters shall be red on white background.

PART 3 - EXECUTION

3.01 BOXES; INSTALLATION AND SUPPORT

- A. Outlet boxes shall be flush with finished surface of wall or ceiling. They shall be plumb and securely fastened to structure, independent of conduit. Except where otherwise indicated, factory-made bar hangers shall be used to support outlet boxes.
- B. Outlet boxes installed in suspended or furred ceilings with steel runner or furring channels, shall be supported, except where otherwise indicated, by a Unistrut #P-4000 channel spanning main ceiling runner channels. Each box shall be supported from its channel by a 3/8" 16 threaded steel rod with a Unistrut #P-4008 nut and a Tomic #711-B Adapta-Stud. Rod shall be tightened to a jamb fit with channel and its nut. Box shall be locked to the rod by means of a 2" locknut on stud and a 3/8" 16 hex nut locking stud to rod.
- C. Heights of outlets and equipment indicated on Drawings shall govern, but absence of such indications, following heights shall be maintained, (Heights are to centerline unless otherwise noted):
 1. Return-call buzzer, communication switch, pushbutton, interphone, light switch, other switches, and fire station outlets: 48".
 2. Bell outlets in corridors: 12" below ceiling.
 3. Clock, speaker, and bell outlets in classrooms and offices: 8'-0".
 4. Outside bell and yard light outlets: 4'-0" above second floor level for 2 or more story buildings, 12" below top plate level for one story buildings without covered porch or arcade, and 12" below covered porch and arcade ceilings.
 5. Desk public telephone, desk interphones, and receptacle outlets 18".
 6. Panelboards and terminal cabinets: 6'-6" to top.
 7. Television outlets shall be located at a height corresponding to location of TV monitor.
- D. Receptacle outlet boxes shall not be located within 6'- 0" of classroom water sinks, except in science laboratory classrooms where a ground fault interrupter circuit-breaker shall be provided to protect receptacle outlets located within 6'-0" of water sinks.

3.02 PLATES

- A. Provide a plate on each new switch, plug, pilot light, buzzer, interphone, public telephone, and television outlet, and on existing and reset outlets where so indicated. Plates shall be of stainless steel unless otherwise specified. Public telephone, interphone and buzzer outlet plates shall have single bushed openings. Sectional plates will not be accepted.
- B. Flush wiring device and signal system outlets indicated to be blank covered, shall be covered with blank stainless steel plates. Flush lighting outlets to be capped shall be covered with Wiremold # 5736 steel covers, painted to match the surrounding finish. Surface-mounted outlets indicated to be capped shall be covered with blank stainless steel covers.
- C. Switch and receptacle plates shall be provided with engraved designations under any one of following:
 - 1. Three gang and larger gang switches.
 - 2. Lock switches.
 - 3. Switches so located that operator cannot see one of the fixtures or items for equipment controlled with his hand on the switch.
 - 4. Switches not in same room with fixtures or items of all unit heaters, air curtains, fly fans, exhaust fans, and GTC.
 - 5. Receptacles operating at other than 120 volts.
 - 6. Where so indicated on Drawings.
 - 7. Switches operating on 277 volts.
- D. Designations shall be as indicated on Drawings or as specified and shall be engraved in plates with 3/16" high block type letters filled with black enamel. Where designations are not indicated or specified they will be given after Contract is awarded. For estimating purposes, they may be assumed not to exceed more than 10 letters per gang.

3.03 IDENTIFICATION OF CIRCUITS AND EQUIPMENT

- A. Switchboards, motor control centers, transformers, panelboards, circuit breakers, disconnecting switches, starters, pushbutton control stations and other apparatus used for operation or control of circuits, appliances or equipment, shall be properly identified by means of descriptive nameplates or tags permanently attached to apparatus or wiring.
- B. Nameplates shall be engraved laminated bakelite or etched metal. Shop drawings with dimensions and format shall be submitted to the Architect before installation. Attachment to equipment shall be with escutcheon pins, rivets, self-tapping screws or machine screws. Self-adhering or adhesive backed nameplates are not acceptable.
- C. Tags shall be attached to feeder wiring in conduits at every point where runs are broken or terminated, and shall include pull wires in empty conduits. Circuit, phase and function shall be indicated. Branch circuits shall be tagged in panelboards and motor control centers. Tags may be made of pressure-sensitive plastic or embossed self-attached stainless steel or brass ribbon.
- D. Cardholders and cards shall be provided for circuit identification in panelboards. Cardholders shall consist of metal frame retaining a clear plastic cover permanently attached to inside of panel door. List of circuits shall be typewritten on a card. Circuit

description shall include name or number of circuit, area, and connected load.

- E. Junction and pullboxes shall have covers stencilled with box number when indicated on Drawings, or circuit numbers according to panel schedules. Data shall be lettered in a conspicuous manner with a color contrasting with finish.
- F. Name as designated in part 2A shall be correctly engraved with a legend indicating function or areas, when required by Codes, or indicated on Drawings.

END OF SECTION



**SECTION 26 05 19
CONDUIT AND WIRE**

PART 1 - GENERAL

1.01 SCOPE

- A. Work Included: All labor, materials, appliances, tools, equipment, facilities, transportation and services necessary for and incidental to performing all operations in connection with furnishing, delivery and installation of the work of this Section, complete as shown on the drawings and/or specified herein. Work includes, but is not necessarily limited to the following:
1. Examine all other sections for work related to those other sections and required to be included as work under this section.
 2. General provisions and requirements for electrical work.

1.02 SUBMITTALS (ADDITIONAL REQUIREMENTS)

- A. Submit product data sheets for all wire, conduit, fittings and splicing materials.
- B. Submit material list for all conduit and fittings.

PART 2 - PRODUCTS

2.01 CONDUIT

- A. Rigid steel conduit: Hot-dip galvanized, zinc coated. Threads shall be galvanized after fabrication.
- B. PVC coated rigid steel conduit: Hot-dipped galvanized after fabrication, with bonded 20 mil coating of polyvinyl chloride.
- C. Electrical metallic tubing: Galvanized. Couplings and connectors, seamless steel construction and of the water-tight compression type with insulated throat, Thomas & Betts Co. #5123 Series or approved equal.
- D. Flexible conduit: Galvanized steel. Connector shall be Thomas & Betts Co. #3312 and/or #3332 Series, complete with insulated throat, or approved equal.
- E. Liquid-tight flexible conduit: Sealitite Type U.A. with Appleton Series "ST" connectors.
- F. Nonmetallic conduit: Polyvinyl chloride, Schedule 40 or type "EB" (concrete encased).

2.02 WIRE AND CABLE

- A. All wire and cable shall be copper, 600 volt, #12 AWG minimum unless specifically noted otherwise on the drawings. Conductors #10 AWG and smaller shall be solid. Conductors #8 AWG and larger shall be stranded. Type of insulation as noted on drawings and as follows:
1. Type THHN/THWN insulation used for #4 AWG and smaller.
 2. Type THW or THHN/THWN insulation used for #2 AWG and larger.
 3. Type THW used for all panel feeders and service conductors.

4. Type THHN insulation used for circuit conductors installed in fluorescent lighting fixture raceways, for conductors connected to the secondary of fluorescent or mercury vapor fixture ballast or other hot locations.
5. Type XHHW or THWN insulation shall be used where conductors are installed in conduit exposed to the weather.
6. The following color code for branch circuits:

Neutral White (Tape feeder neutrals with white tape near connections)

120/208 Volt

480/277 Volt

Ground Green
 Phase A Black
 Phase B Red
 Phase C Blue

Ground Green
 Phase A Brown
 Phase B Orange
 Phase C Yellow

7. Feeders identified as to phase or leg in each panelboard with printed identifying tape.
8. Fire alarm conductors: Use 600-volt, type THHN/THWN conductors and color-coded per equipment manufacturer's recommendations.
9. Panel feeders copper or aluminum: Wire size shown on the drawings is for copper: if aluminum wire is proposed, increase wire size to ampere capacity of copper wire and voltage drop not to exceed that of copper feeders indicated on drawings. Increase conduit size and quantity as required by code.
10. Color coding for mechanical and plumbing control wiring shall be an agreed upon color code between the Mechanical/Plumbing Contractor and the Electrical Contractor, and color code shall be submitted to the Architect in writing for approval prior to installation.

PART 3 - EXECUTION

3.01 TRENCHING, FOOTINGS, SLEEVES

- A. Provide trenching, concrete encasement of conduits, back filling, and compaction for the underground electrical work, in accordance with applicable sections of this specification.
- B. Provide footings for all post and/or pole-mounted lighting fixtures: concrete shall conform to the applicable sections of this specification.
- C. Sleeves
 1. Provide sleeves for raceways and conduit passing through the following construction elements:
 - a. Concrete foundations, floors, walls and slabs.
 - b. Lath and plaster walls and ceilings.
 2. Sleeves shall extend 12 inches above floors, except under floor standing electrical equipment. Sleeves shall be flush with walls ceilings foundations and partitions. Sleeves shall be installed at exact penetration locations and angles to accommodate raceway and conduit routings.
 3. Joists, girders, beams, columns or reinforcing steel shall not be cut or weakened. Where construction necessitates the routing of conduit or raceways through structural members, framing or under footings, written permission to make such installation shall

first be obtained from the Architect. Such permission will not be granted, however, if any other method of installation is possible.

4. The layout and design of raceways and conduits located in or routed through masonry or reinforced beams or walls shall be reviewed by the Architect before any work is performed. All sleeving shall be accomplished according to the instructions of the Architect and shall be accepted before any concrete is poured.
5. Sleeves, raceways and conduit shall be located to clear steel reinforcing bars in beams. Reinforcing bars in walls shall be offset to clear piping and sleeves.
6. Provide 2" continuous clearance between inside of sleeve and exterior of conduits and raceways passing through the sleeve, unless otherwise specified. Where sleeves pass through outside walls below grade, provide full 1" clearance between exterior of conduits and raceways passing through the sleeve. For seismic joints, clearance shall be 3".
7. Sleeves set in fire walls shall be caulked between sleeve, conduit and raceways passing through the sleeve with fireproof sealant.
8. Sleeve Material:
 - a. In floor slab construction: Schedule 40 black steel pipe, with upper surface to be sealed watertight.
 - b. In concrete walls: Schedule 40 black steel pipe. When installed in outside walls, seal outer surface watertight.
 - c. In lath and plaster partitions and ceiling: 24 gauge galvanized iron or steel.
 - d. Sleeves through waterproof membranes: Cast iron or Schedule 40 steel with flashing clamp device and corrosion resistant clamping bolts. Caulk space between pipe and sleeve with outer surface sealed watertight.

3.02 GROUNDING

- A. Grounding shall be executed in accordance with all applicable codes and regulations, both of the State of California and local authorities having jurisdiction.
- B. Where nonmetallic conduit is used in the underground distribution system, the Contractor shall install the proper sized copper ground wire in the conduit with the feeder for use as an equipment ground. The electrical metallic raceway system shall be grounded to this ground wire.
- C. The maximum resistance to ground shall not exceed 5 ohms.
- D. Where an equipment bonding ground wire is installed or where nonmetallic or flexible conduit is used for feeder, subfeeder or branch circuit wiring, a green insulated, copper ground wire, sized in accordance with the following table, shall be installed. Install ground wire in each conduit with phase conductors.

Feeder, Subfeeders & Branch Circuit Protection	Minimum Ground Wire Size
15 Amp	#12
20 Amp	#12
30 to 60 Amp	#10
70 to 100 Amp	#8
101 to 200 Amp	#6
201 to 400 Amp	#3

401 to 600 Amp	#1
601 to 800 Amp	1/0
801 to 1000 Amp	2/0
1001 to 1200 Amp	3/0
1201 to 1600 Amp	4/0
1601 to 2000 Amp	250 MCM
2002 to 2500 Amp	350 MCM
2501 to 4000 Amp	500 MCM

- E. Where conductors are run in parallel in multiple raceways, the grounding conductor shall be run in parallel. Each parallel equipment grounding conductor shall be sized on the basis of the ampere rating of the over current device protecting the circuit conductors in the raceway. When conductors are adjusted in size to compensate for voltage drop, grounding conductors, where required, shall be adjusted proportionately in size.
- F. Ground conductors for branch circuit wiring shall be attached to each outlet to the back of the box using drilled and tapped holes and washer head screws, 6-32 or larger.
- G. Each panelboard, switchboard, pull box or any other enclosure in which several ground wires are terminated shall be equipped with a ground bus secured to the interior of the enclosure. The bus shall have a separate lug for each ground conductor. No more than one conductor shall be installed per lug.

3.03 CONDUIT

- A. The sizes of the conduits for the various circuits shall be as indicated on the drawings and as required by code for the size and number of conductors to be pulled therein. Conduits to be concealed except as noted otherwise.
- B. Rigid steel conduit shall be used in the following areas:
 - 1. Embedded in concrete.
 - 2. Embedded in brick or masonry walls.
 - 3. Exposed on interior of buildings below eight feet.
 - 4. Exposed on exterior of building.
 - 5. Damp or wet locations.

Rigid steel conduit shall not be installed in direct contact with earth or sand.

- C. PVC-coated rigid steel conduit shall be used for all elbows and risers, for underground nonmetallic conduits, and for all underground microphone, speaker and dimming control circuit conduits.
- D. Electrical metallic tubing up to and including 4 inch may be installed as permitted by codes referenced within specifications.
- E. Flexible steel conduit may be used for equipment and transformer connections only.
- F. Liquid-tight flexible conduit shall be used for final connection to motors, control devices mounted on vibrating or rotating equipment, equipment indicated on drawings to have flexible conduit connections, and in all areas where exposed flexible connections are required.
- G. Nonmetallic conduit shall be used for all underground runs unless specifically noted or specified otherwise. Provide PVC-coated steel conduit for all elbows and risers. Nonmetallic conduit shall not be run in slabs or walls, above ceiling or exposed.
- H. Conduit Installation:

1. Conduits shall be supported and braced per OSHPD Anchorage pre-approval No. R-0010 the SMACNA "guidelines for seismic restraints for mechanical systems and plumbing piping systems" or OSHPD Anchorages pre-approval No. R-003 the Superstrut Seismic Restraint System for pipes and conduits only.
2. Securely and rigidly support all conduits from building structure. Provide supports maximum of ten feet on centers and within three feet of all bends, outlets, junction boxes, cabinets, panels and fittings. Conduits shall be supported independent of all piping, duct work, equipment ceiling hanger wires, and suspended ceiling grid systems. All conduits shall be secured by means of approved pipe clamps or straps. The use of "plumbers tape" is prohibited.
3. Individual conduits suspended above ceiling shall be supported by means of hanger rods and pipe clamps. Multiple conduits suspended above ceilings shall be supported by means of trapeze type hangers and pipe clamps.
4. Individual conduits placed against brick, masonry or concrete walls or slabs shall be secured with pipe clamps and expansion shields. Individual conduits placed against dry wall or plaster construction shall be secured by means of pipe clamps and screws attached to studs or other structural members. The use of toggle bolts is prohibited. Provide preformed channel supports for all multiple conduits placed against walls or slabs.
5. Unless otherwise restricted by structural drawings as specifications the maximum size conduit permitted in concrete slabs or walls shall be not be greater than 1/4 of the slab thickness. Conduits installed in concrete slabs shall not cross.
6. Conduit below slab on grade or underground exterior to building shall be spaced a minimum of 3" between identical systems and 12" between power and all other systems except at termination points.
7. Conduits which are installed at this time and left empty for future use shall have polyvinyl rope left in place for future use.
8. Conduits stubbed outside of building line for future use shall be terminated a minimum of five feet clear of building or adjacent concrete walks or A.C. paving and capped and marked. Provide tag engraved with the number and size of conduits and type of service (i.e., "POWER", "TEL.", etc.).
9. Provide expansion and deflection fittings, with bonding jumper at all building expansion or seismic joint crossings.
10. Provide two locknuts and an insulated bushing at each metallic conduit terminating at outlet boxes, junction boxes, terminal cabinets, switchboards and panelboards. Provide insulated bushing at each metallic conduit stub-up location. Bushings shall have ground lugs when installed on a metallic extension of PVC conduit run.
11. Provide metallic or plastic caps on all conduit during construction until installation of conductors.
12. Branch circuit and telephone conduits turned up from floor into interior demountable partitions or to equipment not adjacent to all wall shall terminate in flush coupling at floor and then extend into partition or to equipment. Refer to architectural drawings for location of demountable partitions.
13. Conduit run exposed shall be run at right angles or parallel to the walls or structures. All changes in directions, either horizontally or vertically, shall be made with conduit outlet bodies as manufactured by Crouse Hinds or equal. Conduits run on exposed beams or trellis work shall be painted to match surrounding surfaces. Conduits run exposed on

roofs shall be installed on 2x4 redwood sleepers, maximum 5 foot on centers. Sleepers shall be set in nonhardening mastic.

14. Rigid steel conduit or electrical metallic tubing shall not be strapped or fastened to equipment subject to vibration or mounted on shock absorbing bases.
15. From each panel which is flush mounted in a wall, stub up from top of the panel a minimum of four 3/4" conduits to the nearest ceiling spaces or other accessible location and cap for future use.
16. Conduit rising from floor for motor connection independently supported if over 24" above floor. Support shall not be to a motor or duct work which may transmit vibrations.
17. All conduits, except for 120 or 277 volt branch circuits and communication conduits, which are run exterior to building slab shall be concrete encased. If PVC type EB conduit is used it shall be concrete encased the full length of the conduit installation including under building slab.
18. Concrete for encasement of nonmetallic conduits shall be red 200E PSI with a maximum of 3/4" gravel. Provide prefabricated plastic spacers between each conduit. Provide a minimum of 2" of concrete between each conduit and a minimum of 3" of concrete on top, bottom and side of duct bank. Provide a minimum of 12" of concrete power and signal system conduits. Provide ten pounds of red coloring cement for each cubic yard of concrete.
19. Provide all trenching, excavation, shoring and backfilling required for the proper installation of underground conduits. Bottoms of trenches to be cut to grade. Make trenches 12 inches wider than the greatest diameter on the conduit. All conduits exterior to building slab shall be set on a 6 inch bed of damp sand, and backfilled to within 12 inches of finished grade with damp sand. Remainder of backfill to be native soil. Soil shall have no stones or aggregate greater than 3". Do not backfill until installation has been approved and as-built drawings are up to date. Promptly install all conduits after excavation has been done, so as to keep the excavations open as short a time as possible. All excess soil from trenching shall be removed from the site.
20. Install underground conduit, except under buildings, not less than 24" below finished grade in nontraffic areas and 30" below finished grade in traffic areas, including roads and parking areas. Install long radius bends in all underground conduits in excess of 100 feet long.

3.04 WIRE AND CABLE

- A. Branch circuit and fixture joints for #10 AWG and smaller wire shall be made with UL-approved connectors listed for 600 volts, approved for use with copper and/or aluminum wire. Connector to consist of cone-shaped, expandable coil spring insert, insulated with a nylon shell and 2 wings placed opposite each other to serve as a built-in wrench or shall be molded one-piece as manufactured by "Scotchlok".
- B. Branch circuit joints of #8 AWG and larger shall be made with screw pressure connectors made of high strength structural aluminum alloy and UL-approved for use with both copper and/or aluminum wire as manufactured by Thomas & Betts. Joints shall be insulated with plastic splicing tape, half-lapped and at least the thickness equivalent to the conductor insulation. Tapes shall be fresh and of quality equal to Scotch.
- C. Use U.L. listed pulling compound for installation of conductors in conduits.
- D. Correspond each circuit to the branch number indicated on the panel schedule shown on the drawings except where departures are approved by the Architect or the Owner's inspectors.

- E. All wiring, including low voltage, shall be installed in conduit.
- F. Control wiring to conform to the wiring diagrams shown on the mechanical drawings and the manufacturer's wiring diagrams.
- G. All splices in exterior pull boxes and light poles shall be cast resin encapsulated.
 - 1. Power conductor splices - 3M Scotchcast Series 82/85/90; Plymouth or equal.
 - 2. Control and signal circuits 3M Scotchcast series 8981 thru 8986, Plymouth or equal.
- H. Neatly group and lace all wiring in panelboards, motor control centers and terminal cabinets with plastic ties at 3" on centers. Tag all spare conductors.

END OF SECTION



**SECTION 26 05 36
CABLE TRAY SYSTEM**

Part 1 - GENERAL

1.01 SCOPE

- A. Work Included: All labor, materials, appliances, tools, equipment, facilities, transportation and services necessary for and incidental to performing all operations in connection with furnishing, delivery and installation of the work of this Section, complete, as shown on the drawings and/or specified herein. Work includes, but is not necessarily limited to, the following:
1. Examine all other sections for work related to those other sections and required to be included as work under this section.
 2. General provisions and requirements for electrical work.

Part 2 - PRODUCTS

2.01 MATERIALS

- A. Cable tray systems shall be made of aluminum steel alloy 6063-T6.
- B. Manufacture shall be CPI Chatsworth or equals.

2.02 STEEL NUTS AND BOLTS

- A. Steel nuts and bolts shall be protected with caddiom plated with yellow irrdite dip.

2.03 DIMENSIONS

- A. Ladder trays:
1. Lengths of straight sections: 10 feet plus or minus 3/16 inch.
 2. Widths: 18 inches plus or minus 1/4 inch inside dimension. Overall widths shall not exceed inside widths by more than 4 inches.
 3. Depths: Inside depths shall be 18 inches plus or minus 3/8 inches. Outside depths shall not exceed inside depths by more than 1 1/4 inches.
 4. Rung spacing on straight sections: 9 inches on centers.
 5. Radii: 12 inches.
 6. Degree of arc for elbows: 90 degrees.

2.04 PROTECTION OF CABLE INSULATION

- A. The inside of cable tray systems shall present no sharp edges, burrs, or projections which can damage cable insulation.

2.05 FITTINGS

- A. The design and construction of fittings shall be based on the assumption that they will be supported in accordance with the recommendations given in 3.01 for locations.

2.06 MARKETING OF TRAYS WHEN USED AS EQUIPMENT GROUNDING CONDUCTORS

- A. When steel or aluminum cable tray systems are used as equipment grounding conductors, cable tray sections and fittings shall be marked to show the minimum cross-sectional area in accordance with the Article 318 of the NATIONAL ELECTRICAL CODE.

Part 3 - EXECUTION

3.01 SUPPORTS

- A. Supports for cable trays should provide a strength and working load capacity sufficient to meet the load requirement of the cable tray systems.
 - 1. Horizontal and vertical tray supports should provide an adequate bearing surface for the tray and should have provisions for hold down clamps or fasteners.
 - 2. In addition, vertical tray supports should provide secure means of fastening cable trays to supports.

3.02 SUPPORT LOCATIONS

- A. Horizontal cable tray straight sections:
 - 1. Horizontal cable tray straight sections should be supported at intervals not to exceed the support span for the appropriate NEMA Class Designation. Unspliced straight sections should be used on all simple spans and on end spans of continuous span runs. A support should be located within 2 feet of each side of an expansion connector. Straight section lengths should be equal to or greater than the span length to ensure not more than one splice between supports.

3.03 HORIZONTAL CABLE TRAY FITTINGS

- A. Horizontal Elbow Supports:
 - 1. Supports for horizontal tray fittings should be placed within 2 feet of each fitting extremity, and as follows:
 - a) 90-degree supports at the 45-degree point of arc.
 - b) 60-degree supports at the 30-degree point of arc.
 - c) 45-degree supports at the 222-degree point of arc (except for the 12-inch).
 - d) 30-degree supports at the 15-degree point of arc (except for the 12-inch).

3.04 FITTINGS AS END OF RUN

- A. A fitting which is used as an end of the run dropout should have a support attached to it, firmly reinforcing the fitting.

3.05 PROTECTION OF CABLE INSULATION

- A. The inside of cable tray system should present no sharp edges, burrs, or projections which could damage cable insulation.

END OF SECTION

SECTION 26 24 16
PANELBOARDS AND SIGNAL TERMINAL CABINETS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Lighting and power distribution facilities, including panelboards.

1.02 SUBMITTALS

- A. Shop Drawings: Include a front elevation, indicate cabinet dimensions, make, location and capacity of equipment, size of gutters, type of mounting, finish, and catalog number of locks.

1.03 DESIGN REQUIREMENTS

- A. Lighting and Appliances Panelboards:

1. Lighting and appliance panelboards shall be wall-mounted, enclosed safety type with 277/480 volt, 4-wire or 120/208 volt, 4-wire solid neutral mains as indicated on Drawings or specified.
2. Single pole branches shall be molded case, thermal magnetic circuit breakers with inverse time delay, trip free, quick-make, quick-break mechanism and silver alloy contacts. Circuit breakers shall be rated as indicated on Drawings, with ampere rating marked on handle and shall indicate "ON - OFF" and tripped positions. Ground fault interrupters shall be incorporated into circuit breakers where indicated. They shall be listed by UL as a ground fault device.
3. Two and 3 pole branches shall be enclosed, and shall be thermal magnetic circuit breakers with inverse time delay, non-tamperable, ambient compensated, single handle, internal common trip, and quick-make, and quick-break mechanism with silver alloy contacts. Circuit breakers shall be rated as indicated on the Drawings.
4. Main and subfeeder circuit breakers shall be enclosed, thermal magnetic type with inverse time delay, single handle common trip, quick-make, quick-break mechanism, corrosion resistant bearings and silver alloy contacts. Ampere frame size and trip rating shall be as indicated on Drawings. Breakers over 225 amperes shall have interchangeable trip units. Handles of main and subfeeder circuit breakers shall be under cabinet door. Voltage rating shall be as indicated on Drawings.
5. All circuit breakers shall be one-piece, bolt-on type and shall meet short circuit interrupting capacity requirements indicated on Drawings, including series rating.
6. Breakers shall have a minimum short circuit interrupting rating of 10,000 symmetrical for panels board voltage 240 volts and 14,000 symmetrical thru 600 volts or as specified on drawings. Interrupting rating shall not be less than what is indicated on drawings.
7. All internal connections indicated of outdoor panelboards shall be made with plated copper bus bars and the busses shall extend for full length of space available for branch circuit breakers. All internal connections shall be made with plated aluminum bus bars for indoor panelboards. Feeder cable connectors shall be installed at point of feeder entrance. All terminals shall have copper conductors. Panelboards fed by conductors having overcurrent protection greater

than 200 amperes shall be protected on supply side by overcurrent devices having a rating not greater than that of panelboard.

8. Except where otherwise indicated, circuit breakers shall be in 2 vertical rows connected to bus bars in a distributed phase arrangement. Two pole branches shall be balanced on busses. Each single pole branch shall be numbered adjacent to its circuit breaker with odd numbers on left and even numbers on right.
9. All specified circuit breaker spaces shall include necessary hardware required for future installation of circuit breakers.
10. Provide locking devices for each individual circuit breaker. Padlocking device shall be secured to circuit breaker and by panel deadfront plate.

B. Power Panelboards: Power panelboards shall conform to the Specifications for lighting and appliance panelboards, where applicable, except that mains shall be bussed 240 or 480 volts, 3 phase, or as required, and that branches shall be enclosed, quick-make, quick-break thermal-magnetic circuit breakers with inverse time delay trip, of frame size and trip rating indicated, and with corrosion-resistant bearings, silver alloy contacts and single handle, common trip, free operation. Breakers over 225 ampere size shall have interchangeable trip units. Main shall be as indicated on Drawings. All circuit breakers shall be one-piece, bolt-on type.

C. Panelboard Cabinets:

1. Panelboard cabinets shall be code gage galvanized steel or blue steel; fronts, doors, and trims shall be code gauge furniture steel. Cabinets shall have at least 6" high gutters at top and bottom where feeder cable size exceeds #4 or where feeder cable passes through cabinet vertically. Cabinets shall have top and bottom gutters sized as required by inspection department having jurisdiction, but never less than 6" where more than one feeder enters top or bottom of cabinets. Side gutters shall not be less than 4" wide. Width of cabinets shall be 20", unless indicated different on Drawings.
2. Where contactors, time switches, and control devices are specified or indicated to be installed within panelboard cabinets, a separate compartment and door shall be provided at top of cabinet for such devices. Door shall be sized as required to permit removal of contactor and other devices intact. Gutters shall be provided at sides and top of compartment.

D. Panelboard Schedule: Contractor shall prepare a neatly typewritten schedule with number or name of room or area, or load served by each panelboard circuit. Room numbers or names used shall be determined at site and shall not necessarily be those used on Drawings. Schedule shall also indicate panel designation, voltage and phase, building and distribution panel or switchboard from which it is fed. Schedule shall be mounted in a frame under transparent plastic 1/32" thick on inside of each panelboard cabinet door.

E. Panelboard Standards: All panelboards shall meet latest revisions of following standards:

1. National Electric Code, Article 384.
2. UL 67, Panelboards.
3. UL 50, Cabinets and Boxes.
4. UL 943, GFCI.
5. UL 489, Molded case circuit breakers.
6. NEMA PBI.
7. Federal Specifications W-P-115 and WC-375B.
8. Panelboards must be UL labeled.

F. Terminal Cabinets, Signal:

1. All signal terminal cabinets shall conform in every respect to the Specifications for panelboard cabinets, except as modified herein.
2. All terminal cabinets shall be flush type, with 2" trim or surface mounted type, as indicated on Drawings. All terminal cabinets shall have section. Cabinets shall be provided with barriers to separate each system. Sections over 24" in width shall be provided with double door and lock. Each terminal cabinet, or section of a terminal housing a separate system, shall measure 12" long x 18" high x 5-3/4" deep, unless otherwise indicated on Drawings. Trims for sectional cabinets shall be of one-piece construction.
3. All terminal cabinets shall be equipped with 3/4" thick plywood backboards within cabinets, and fastened in place with machine screws. Backboards shall be largest size cabinet and conduit terminations will permit.
4. Flush mounted terminal cabinets shall be finished as specified for flush mounted panelboard cabinets. Surface and semi-flush mounted terminal cabinets shall be finished as specified for surface mounted panelboard cabinets.

PART 2 - PRODUCTS

2.01 EQUIPMENT

- A. Panelboards shall be manufactured by RSE Sierra, Square D, Eaton, or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Fronts shall be flush or surface type, as required. Fronts shall be fastened to cabinets with 1/4" #20, nickel-plated oval-headed machine screws and cup washers. Sufficient screws shall be installed to prevent buckling or warping of cabinet front. Flush type fronts shall be aligned plumb and square and cabinet shall be drilled and tapped, at site, for cover screws, to accomplish this if necessary.
- B. All surfaces of flush mounted cabinets shall be galvanized. Fronts shall be given 2 coats of metal primer and shall not be installed on cabinets until after finish coats of paint have been applied to wall and cabinet fronts and are thoroughly dry. Screws and cup washers shall not be painted.
- C. All surfaces of surface mounted cabinets and fronts shall be given one coat of metal primer and a finish coat of baked-on gray enamel.
- D. Cabinets shall be rigidly supported in place, independent of conduits.
- E. On floor-standing units, provide 1" minimum grout to set and level cabinets.
- F. All equipment exposed to the weather shall be provided with NEMA 3R enclosures whether or not shown on the drawings. Equipment located in rooms, building cavities or closets without doors or protection from the weather shall be provided with NEMA 3R enclosures.

END OF SECTION



**SECTION 26 50 00
LIGHTING FIXTURES**

PART 1 - GENERAL

1.01 GENERAL

- A. Provide light fixtures complete including lamps, ballasts, sockets, housing, ceiling trim rings for special ceilings, brackets, diffusers/ lenses and outlet boxes.
- B. The catalog numbers included in the description of the various types of lighting fixtures shall be basically considered to establish the type or class of the fixture with a particular manufacturer only. The fixture length, number of lamps, component materials, accessories, mounting type and all other features required to fulfill the total description of the fixture based on all drawing and specification information shall be complied with regardless of whether or not the catalog number specifically includes these features. If any conflict exists between the catalog number and the description, the Contractor shall either resolve the conflict with the Architect prior to submittal of his bid or furnish the fixture to meet the intent as later interpreted by the Architect without change in contract price.
- C. Lighting fixtures shall be of types as indicated in fixture schedule on drawings.
- D. All fixtures of one type shall be of one manufacturer and of identical finish and appearance, unless indicated otherwise on drawings.

1.02 SCOPE

- A. Work Included: All labor, materials, appliances, tools, equipment necessary for and incidental to performing all operations in connection with furnishing, delivery and installation of the work of this Section, complete, as shown on the drawings and/or specified herein. Work includes, but is not necessarily limited to the following:
 - 1. Examine all other specification sections and drawings for related work required to be included as work under Division Sixteen.
 - 2. General provisions and requirements for electrical work.

1.03 SUBMITTALS

- A. If requested by the architect, provide a sample of any fixture proposed as a substitution for a specified fixture. Sample fixture shall be complete with lamps, cord and plug for 120 volt operation. Fixture shall be delivered to the Engineer's office for review and shall be picked up within ten (10) working days after review comments have been received; any samples left over this time will be discarded by the Engineer. Decision of Engineer regarding acceptability of any fixture is final.
- B. Provide complete manufacturers catalog data information for each light fixture, ballast and lamp.

PART 2 - PRODUCTS

2.01 BALLASTS (HID & FLUORESCENT)

- A. Fluorescent fixtures shall be equipped with ETL approved C.B.M. certified high ballasts. Ballasts shall have Class "P" protection. Where not available provide dual element fusing. Ballast shall be sound rated "A". Fluorescent ballasts shall be full light output rated.
- B. High intensity discharge ballast shall be suitable for -20F starting be a high power factor type ballast. Voltage required per drawings, and low noise type.

2.02 LAMPS

- A. Provide lamp as specified on drawings, and shall be energy saving type except when fixture is to be dimmed, provide standard lamps.

2.03 LIGHT FIXTURES

- A. Lighting fixtures shall have all parts and fittings necessary to complete and properly install the fixture. All fixtures shall be equipped with lamps of size and type specified.
- B. Fixtures shall be wired from outlet boxes supplied with fixture to socket with #14 AWG Underwriters' Type "AF" or "CF" fixture wire.
- C. Where fixture color is indicated to be selected by the Architect, provide two color chip samples for review.
- D. The fixture to bear Underwriters Laboratories' label of approval for the wattage indicated.

2.04 LENS AND DIFFUSERS

- A. Diffusers shall be formed from cast sheet having a minimum unpenetrated thickness of 0.125" and, in any event, shall be of sufficient thickness and or proper construction and camber to prevent the diffusers from having any noticeable sag over the entire normal life of the installation.
- B. Acrylic lenses shall be manufactured from 100% acrylic as manufactured by Rohm & Hass, called Plexiglas V, V Type 920, VM, or an approved equal by either injection molding or by extraction.

PART 3 - EXECUTION

3.01 LIGHT FIXTURE MOUNTING HARDWARE

- A. It is the Contractor's responsibility to verify actual ceiling construction type as defined on the architectural drawings and furnish all lighting fixtures with the correct mounting devices and proper operating voltage whether or not such variations are indicated by fixture catalog number. The Contractor shall verify depth of all recessed lighting fixtures with architectural drawings prior to ordering fixtures. Any discrepancies that would cause recessed lighting fixtures not to fit into ceiling shall be reported to the Architect prior to ordering of the fixtures.
- B. Surface mounted fixtures installed on drywall or plaster ceilings and weighing less than 50 pounds may be supported from outlet box. Provide structural supports above drywall or plaster ceilings for installation of fixtures weighing more than 50 pounds and secure fixture to structural supports. The use of toggle bolts is prohibited.

3.02 LAMPS

- A. Fluorescent and lamps controlled by dimming equipment shall be operated (aged) for 100 continuous hours without interruption, at 100% output prior to occupancy of the building by the Owner.

3.03 LENS AND DIFFUSERS

- A. Lens and diffusers shall be completely cleaned of all dust, dirt and fingerprints after the installation of the light fixtures, ceiling, painting, lamps, and prior to occupancy of the facility by the Owner.

3.04 BALLASTS

- A. Ballasts remote from the lighting fixture, mounted as shown on the drawings and designed for remote operation. Additional wiring and conduit shall be provided whether shown on the drawing or not, between lighting fixture and remote ballasts with required quantity of "THHN" wire to operate said fixture(s).
- B. Provide proper type and quantity of conductors with conduit system for proper operation of dimming system, whether or not shown on drawings.
- C. Contractor shall tandem wire (1) one lamp or (3) three lamp fluorescent fixtures when fixture is recessed mounted and within (8) eight feet of each other or if surface or pendant mounted within (1) one foot of each other. To accomplish tandem wiring, a tandem wiring harness shall be installed between inboard master ballast and inboard slave lamp located in adjacent fixture. Night light or emergency light fixtures shall not apply.

END OF SECTION



SECTION 28 23 00
VIDEO SURVEILLANCE GENERAL PROVISIONS

PART 1 - GENERAL

1.01 WORK REQUIRED BY CONTRACT DOCUMENTS

- A. The Vendor/Contractor shall furnish and install a certified Telecommunications System (hereinafter referred to as the "TS"), as specified herein and as shown on the contract drawings. The Vendor/Contractor shall be referred hereinafter as the "Contractor". The TS shall consist of copper and optical fiber station cable and hardware connecting between work area outlets.

1.02 RESPONSIBILITIES

- A. The Telecommunications System installation shall comply with all applicable codes, standards, and regulations including, but not limited to ANSI, BICSI, EIA/TIA, FCC, IEEE, NFPA, OSHPD, UL, ISO/IEC, state and local codes.

1.03 SYSTEM DESCRIPTIONS

- A. The system shall be Contractor furnished / Contractor installed.
- B. The system shall be installed with a Bosch or equivalent camera system and must provide (1) one full year of video stored and accessible to the customer 24/7. The system shall provide remote viewing for up to (4) users and come equipped with all software and hardware needed to obtain every portion of the spec and drawings.
- C. The Contractor shall provide a turnkey installation including all hardware, outlets, jacks, faceplates, station cable, riser cable, patch panels, termination blocks, equipment racks/cabinets, wire management, ladder rack, labeling, connectors, couplers, sleeves, fire stop sealant, and other miscellaneous installation materials and labor as necessary for a complete, tested and certified.
- D. The Telecommunications System (TS) shall be installed and configured to provide computer data, voice and TV connectivity from each outlet indicated on the contract drawings and described herein.
- E. Any miscellaneous materials and/or labor not specified herein, but required for a complete installation of the TS shall be considered a part of these specifications and shall be provided.
- F. Station cable shall include unshielded twisted pair copper cable, unless otherwise noted.
- G. All cable shall be properly rated for the environment where installed.
- H. Any hardware, cable, accessories or other miscellaneous materials or wire not specified herein, but necessary for a complete, installed, certified system shall be deemed a part of this specification and provided by the Contractor.
- I. Manufacturers and models numbers mentioned herein are intended to establish a required level of performance and quality. Due to the high-end performance nature of this system, any substitutions must be approved prior to use.
- J. Base bid shall include category 6 data station cable and hardware.



- K. All station cable shall be terminated on outlets at the work stations. Cat 6 data, voice and TV cable shall be terminated on patch panels.
- L. Fiber optic cable shall be terminated on fiber patch panels.
- M. Application standards supported shall include, but not be limited to: IEEE 802.3, 10Base5, 10BASE-T, 100Base-T, 1000BASE-T, 25/155 mbs ATM, IEEE 802.5, 4 Mbps, 16Mbps (328 ft [100m]), and TP-PMD. Additionally, the NCS shall be capable of supporting evolving high-end applications such as 1 Giga-bit Ethernet.
- N. Data network equipment, desktop equipment and jumper cords will be furnished and installed by others.
- O. The Contractor shall furnish and install wiring to, and patch panels and fiber termination equipment at the owner furnished data equipment.
- P. The Contractor shall furnish and install equipment racks/cabinets for mounting owner furnished data equipment as shown on the drawings or specified herein.

1.04 SYSTEM CABLING AND BASIC REQUIREMENTS

- A. Station Cable
 - 1. All station cable including unshielded twisted pair (UTP), coaxial cable, and/or fiber optic cable.
- B. Compliance
 - 1. Contractor shall confirm requirements for plenum or non-plenum cable with the general contractor prior to cable installation.
- C. Hardware
 - 1. Required hardware includes, but is not limited to, outlets, patch panels, equipment racks/cabinets, termination blocks, connectors, couplers, fastening devices, wire management, cable ladder racks, labeling materials, miscellaneous hardware and tie-wraps, and any other materials and accessories required to comply with this specification. Items shall be UL Listed.

1.05 GROUNDING AND BONDING

- A. All grounding and bonding shall meet the National Electrical Code (NEC®) and BICSI requirements as well as any local codes that specify additional grounding and/or bonding requirements.
- B. Bonding and Grounding –
 - 1. Communication bonding and grounding shall be in accordance with the NEC® and BICSI requirements.
 - 2. Horizontal equipment shall be grounded in compliance with ANSI/NFPA 70 and local requirements and practices.
 - 3. Horizontal equipment includes cross connect frames, patch panels and racks/cabinets.



4. Horizontal equipment shall be grounded utilizing a #6-AWG or larger bonding conductor to grounding panels provided in each telecommunications room.
5. Bonding and grounding of outlet boxes, conduit, sleeves, and cable tray shall be provided by the project electrical contractor.
6. Bonding and grounding of all equipment, patch panels, termination blocks, equipment racks/cabinets, ladder rack, and other passive hardware shall be provided by the Contractor.

1.06 WARRANTY

- A. A 25 year parts and labor warranty shall be provided for the Telecommunications cabling System. This warranty shall cover the installed cabling system against the performance minimum expected results defined in ANSI/TIA/EIA-568.
- B. Extended Product Warranty
 1. The Contractor shall warrant the Telecommunications System against all defects of products or workmanship, and shall guarantee that the NCS will exceed the specifications of ANSI/TIA/EIA-568-B.1, ANSI/TIA/EIA-568-B.2 (including B.2-1, SP-3727-AD1-TIA/EIA Category 5e Standard), ANSI/TIA/EIA-568-B.3 and ISO/IEC IS 11801, exceed all the parameter performance requirements of above standards for cabling links/channels, that the installation will exceed the loss and bandwidth requirements of above standards for fiber links/channels, for a twenty five (25) year period from the date of acceptance.
 2. The extended warranty shall cover the repair or replacement of defective materials, and labor to diagnose failures and repair or replace defective materials.
 3. The extended warranty shall include a full plan and procedure and include all labor to dispatch a technician 24/7 to the site, including any dispatch fees.
- C. System Certification
 1. Upon successful completion of the installation and subsequent inspection, the customer shall be provided with a numbered certificate, from the manufacturing company, registering the installation and assuring the manufacturer's backing of the system warranty.

1.07 NOT USED

1.08 NOT USED

1.08 CUSTOMER TRAINING AND SYSTEM INTEGRATION

- A. Contractor to provide a full plan to train and integrate the existing system to the new surveillance. Training is required for all IT and users to fully complete system updates.
- B. The contractor shall supply personnel to train key customer personnel in the operation and maintenance of the installed system. The training program shall be designed to provide a comprehensive understanding and basic level of competence with the system. It shall be sufficiently detailed to allow customer personnel to operate the system independent of any outside assistance. On-line contact sensitive help screens shall be incorporated into the system to further facilitate training and operation.



- C. The training time shall not be less than a total of 32 hours, and shall consist of:
- 16 hours during normal business hours for system operators. Specific schedules shall be established for the convenience of the customer.
 - 8 hours shall be provided to the supervisory personnel so that they are familiar with the system operation.
 - 8 hours shall be provided to all RCIT personnel that will be networking or working within the surveillance system to be fully operations and troubleshoot/diagnose all software or hardware issues.

PART 2 PRODUCTS

2.01 EQUIPMENT MANUFACTURER

- A. The proposed hardware and cable manufacturer(s) shall have minimum of five (5) years experience manufacturing and installing certified Telecommunications Systems, shall be ISO 9001 Certified and installation team must hold BICSI Technician Certification. Terms and conditions of the manufacturer's warranty shall be submitted as part of closeout documentation.
- B. Contractor shall furnish and install a certified system as specified herein, with complete system certification and system warranty by a single manufacturer. Systems that cannot be certified by a single manufacturer, or that carry warranties of multiple manufacturers will not be acceptable.
- C. All cable and hardware shall be the standard (i.e. not custom built for this project) products of approved manufacturers.
- D. All parts and components shall be within the product solutions of the specified system.
- E. All cable, hardware, miscellaneous materials or other work not specified herein but necessary for proper installation and certification of the system shall be deemed a part of these specifications.

2.02 STATION CABLE (HORIZONTAL)

- A. Category 6 UTP Copper Twisted Pair Station Cable
1. CCTV twisted pair copper cables shall consist of: category 6, 4 pair 23 AWG, and shall be terminated on the 8 pin RJ45 modular jacks provided at each outlet, unless otherwise noted.
 2. Cable jacket shall comply with Article 800 NEC for use as a plenum non-plenum or OSP cable as required. The 4 pair UTP cable shall be UL® and c (UL®) Listed for plenum, non-plenum or OSP use as required.
 3. All 4 pair Category 6 cables shall conform to TIA/EIA 568B.1/B.2 Commercial Building Telecommunications Cabling Standard, Horizontal Cable Section, and be certified by UL®.
 - a. Applications standards supported should include, but be not limited to, IEEE 802.3, 1Base5, 10BASE-T; IEEE 802.5, 4 Mbps, 16Mbps (328 ft [100m], and TP-PMD. In addition, these cables shall be capable of supporting evolving high-end applications



such as 1000 Base -T and 52/155 Mbps ATM, and shall meet or exceed the electrical and mechanical specifications.

4. CCTV cable shall be Superior Essex Part #66-240-6B or equal.
5. OSP cable shall be Superior Essex Part #04-001-68 or equal.

2.03 FIBER OPTIC CABLING

- A. Fiber optic cable shall be UL® Listed. Inter-building fiber should be composite/hybrid, indoor/outdoor, riser rated. Strand counts: 12 SM/12MM and 24SM/24M. Cable shall be all-dielectric, riser-rated, stranded loose-tube design with dry waterblocking for indoor and outdoor use in fiber counts from two to 288. Each fiber shall be distinguishable by means of color coding in accordance with TIA/EIA-598-B, "Optical Fiber Cable Color Coding." The fibers shall be colored with ultraviolet (UV) curable inks. Buffer tubes shall be made from polypropylene. Each buffer tube shall contain a water-swellaable yarn for water-blocking protection. The water-swellaable yarn shall be non-nutritive to fungus, electrically non-conductive, and homogenous. It shall also be free from dirt and foreign matter. This yarn will preclude the need for other waterblocking material; the buffer tubes shall be gel-free. The optical fibers shall not require cleaning before placement into a splice tray or fan-out kit. The buffer tubes shall be manufactured to a standard 3.0 mm in size, regardless of fiber count, to reduce the number of required installation and termination tools. Buffer tubes containing fibers shall be color coded with distinct and recognizable colors in accordance with TIA/EIA-598-B. Buffer tube colored stripes shall be inlaid in the tube by means of co extrusion when required. The nominal stripe width shall be 1 mm. Buffer tubes in a hybrid cable (cable containing more than one type of fiber) shall contain only one fiber type. Identification of fiber types in a hybrid cable shall correspond to fiber-core diameter (or mode-field diameter) from smallest to largest in accordance with TIA/EIA-598-B. Buffer tubes shall be stranded around the dielectric central member using the reverse oscillation stranding process. Two polyester yarn binders shall be applied contra helically with sufficient tension to secure each buffer tube layer to the dielectric central member without crushing the buffer tubes. The binders shall be non hygroscopic, non wicking, and dielectric with low shrinkage. Water swellaable yarn(s) shall be applied longitudinally along the central member during stranding. For dual layer cables, a second (outer) layer of buffer tubes shall be stranded over the original core to form a two-layer core. A water swellaable tape shall be applied longitudinally over both the inner and outer layer. The water swellaable tape shall be non-nutritive to fungus, electrically non-conductive, and homogenous. It shall also be free from dirt and foreign matter. Cable shall be comprised of water-swellaable yarns and/or tapes, dielectric strength members (as required), ripcord(s) and a PVC jacket. The flame-retardant PVC jacket shall contain carbon black to provide ultraviolet light protection and shall not promote the growth of fungus. Cable jackets shall be marked with the manufacturer's name or file number, fiber count and fiber type, month and year of manufacture, sequential meter or foot markings, a telecommunication handset symbol as required by Section 350G of the National Electrical Safety Code®, fiber count, and fiber type, flame rating and listing marking. The actual length of the cable shall be within -0/+1% of the length markings. The print color shall be white, with the exception that cable jackets containing one or more coextruded white stripes, which shall be printed in light blue. The height of the marking shall be approximately 2.5 mm. Cable shall have a storage temperature range of -40° to +70°C, an installation temperature range of -10° to +60°C, and an operating temperature range of -40° to +70°C. Cable shall have a short-term tensile rating of 2600 N, and a long-term (residual) tensile rating of 810 N. Cable shall be listed OFNR/FT-4 and be fully compliant with ICEA S 104 696. Manufacturer shall be ISO 9001 and TL 9000 registered. Cable manufacturer shall have a minimum of 20 years in manufacturing optical fiber cable in order to demonstrate reliable field performance. Cable and fiber manufacturer shall be the same company to ensure long-term reliability of the cabled fiber and to ensure the availability of fully integrated technical support.



B. Multimode Fiber Specifications:

1. Each fiber in the cable must be usable and meet required specifications. Each optical fiber shall be sufficiently free of surface imperfections and inclusions to meet the optical, mechanical and environmental requirements of this specification. A germania-doped silica core surrounded by a concentric silica glass cladding shall comprise each optical fiber. The fiber shall be a matched clad design manufactured by the outside vapor deposition process (OVD). Each optical fiber shall be proof tested by the fiber manufacturer at a minimum of 100 kpsi (0.7 GN/m²). The fiber shall be coated with a dual-layer acrylate protective coating. The coating shall be in physical contact with the cladding surface. The attenuation specification shall be a maximum value for each cabled fiber at 23 ± 5°C on the original shipping reel. The multimode fiber shall meet TIA-492AAAC, "Detail Specification for 850-nm Laser-Optimized, 50-µm Core Diameter/125-µm Cladding Diameter Class Ia Graded-Index Multimode Optical Fibers."

The core diameter shall be 50.0 ± 2.5 µm. The cladding diameter shall be 125.0 ± 2.0 µm. The cladding non-circularity shall be = 1.0%. The core-clad concentricity shall be = 1.5 µm. The coating diameter shall be 245 ± 5 µm. The optical fiber refractive index profile shall be graded. The numerical aperture of the fiber shall be 0.200 ± 0.015.

The maximum cabled fiber attenuation shall be 3.0 dB/km at 850 nm and 1.5 dB/km at 1300 nm for all cable types. The cabled optical fiber shall have an equivalent effective modal bandwidth (EMB) of 4700 MHz·km at 850 nm in accordance with FOTP-220 for 10 Gigabit Ethernet.

The cabled optical fiber shall support industry-standard IEEE 802.3 10GBASE-S (10 Gigabit Ethernet at 850 nm) physical layer specifications for 550 m, when used in Pretium™ Solutions cable, connectors, and patch cords. The cabled optical fiber shall support industry-standard IEEE 802.3 1000BASE-SX (Gigabit Ethernet at 850 nm) physical layer specifications for 1000 m and 1000BASE-LX (Gigabit Ethernet at 1300 nm) for 600 m. The cabled optical fiber shall support industry-standard multi-gigabit Fibre Channel physical interface specifications.

There shall be no point discontinuity greater than 0.2 dB. The attenuation coefficient at 1380 nm shall not exceed the attenuation coefficient at 1300 nm by more than 3.0 dB/km. The attenuation due to 100 turns of fiber around a 75 mm diameter mandrel shall not exceed 0.5 dB at 850 nm and 1300 nm.

C. Single-Mode Fiber Specifications:

1. A germania-doped silica core surrounded by a concentric silica glass cladding shall comprise each optical fiber. The fiber shall be a matched clad design manufactured by the outside vapor deposition process (OVD). Each optical fiber refractive index profile shall be step index.

Each fiber shall be proof tested by the fiber manufacturer at a minimum of 100 kpsi (0.7 GN/m²). The fiber shall be coated with a dual acrylate protective coating and the coating shall be in physical contact with the cladding surface. The single-mode fiber shall meet EIA/TIA-492CAAB, "Detail Specification for Class IVa Dispersion-Unshifted Single-Mode Optical Fibers with Low Water Peak," and ITU-T G.652.C, "Characteristics of Single-Mode Optical Fiber Cable." Fiber shall have a mode field diameter of 9.20 ± 0.40 µm at 1310 nm and 10.40 ± 0.50 µm at 1550 nm. Fiber core-clad concentricity shall be = 0.5 µm. Fiber cladding diameter shall be 125.0 ± 0.7 µm. Fiber cladding non-circularity shall be = 0.7%. Fiber coating diameter shall be 245 ± 5 µm.

The attenuation specification shall be a maximum value for each cabled fiber at 23 ± 5°C



on the original shipping reel. The cabled fiber attenuation for Loose Tube and Ribbon cable constructions shall be < 0.4 dB/km at 1310 nm and <0.3 dB/km at 1550 nm. For Tight Buffered constructions the cabled fiber attenuation shall be <1.0 dB/km at 1310 nm and <0.75 dB/km at 1550 nm. The attenuation at the water peak (1383 nm) shall not exceed the 1310 nm attenuation value. The cabled fiber shall be capable of operating in the 1360 nm to 1480 nm water peak region.

The attenuation due to 100 turns of fiber around a 50 ± 2 mm diameter mandrel shall not exceed 0.05 dB at 1310 nm and 0.10 dB at 1550 nm. The attenuation due to 100 turns of fiber around a 75 ± 2 mm diameter mandrel shall not exceed 0.10 dB at 1625 nm. There shall be no point discontinuities greater than 0.10 dB at 1310 nm and 1550 nm.

The maximum dispersion shall be = 3.2 ps/(nm·km) from 1285 nm to 1330 nm and shall be =18 ps/(nm·km) at 1550 nm. The cabled fiber shall support Gigabit Ethernet (GbE) operation according to the 1000BASE-LX (1310 nm) specifications up to 5000 m in accordance with the GbE standard. The cabled fiber shall support laser-based 10 Gigabit Ethernet (10GbE) operation according to the 10GBASE-LX4 (1300 nm region), 10GBASE-L (1310 nm) and 10GBASE-E (1550 nm) specifications for distances of 10 km, 10 km and 40 km, respectively.

The cabled optical fiber shall support industry-standard multi-gigabit Fibre Channel physical interface specifications.

D. Sheath Construction:

1. Inter-Building Cables: Composite/hybrid, indoor/outdoor, armored, loose-tube, riser rated

E. Splicing:

1. All fiber optic splicing shall be done with a maximum of .03db loss at each splice. Contractor must have a fusion splice Corning ILID system and be able to provide splice readings for each individual splice to the owner upon request.

F. Warranty and Certification:

1. OTDR and light meter certification will be submitted at the completion of the project to the owner via hard copy and electronically for each individual fiber strand and cable.
2. Contractor MUST have Corning Certification in LAN/WAN based fiber optic networks and be able to warranty the fiber optic system for 20 years.

2.04 EQUIPMENT RACKS, CABLE MANAGEMENT, AND LADDER RACKS

- A. Equipment racks/cabinets, cable management, and ladder racks shall be provided as specified herein to house Contractor provided patch panels and fiber shelves. Equipment racks/cabinets and cable management shall be the standard (i.e. not custom designed or built for this project) product of a single approved manufacturer.

B. Equipment Racks:

1. Equipment racks shall be standard 84" high EIA 19" wide racks drilled and tapped with 12-24 thread mounting holes on front and back rails for a minimum of 44 standard EIA rack spaces.



2. Equipment racks shall be designed to be self standing, constructed of steel or aluminum, shall be firmly fastened to the floor, fastened to ladder rack for extra support, and properly grounded.
 3. Provide with front and back vertical cable management on both sides and between racks.
 4. Provide with horizontal cable management below, and between each 48 port copper or fiber patch panels.
 5. Racks shall be seismically braced to the satisfaction of the Local Authority having Jurisdiction and all local, state and federal requirements.
 6. Racks shall be UL listed and black in color.
 7. Chatsworth Products.
- C. Floor-Mounted Cabinet:
1. Communications closets shall be equipped with equipment cabinets to house Owner-provided equipment.
 2. Cabinets shall be lockable and sized to accommodate all patch panels, fiber enclosures, horizontal and vertical cable management and all provided equipment.
 3. All cabinets shall be grounded to the isolated ground bar using a standard ground lug and #6 jacketed green cable.
 4. Cabinets shall be seismically braced to the satisfaction of the Local Authority having Jurisdiction and all local, state and federal requirements.
 5. Cabinets shall be 14 gauge carbon steel or better. All welded steel construction with adjustable square-punched mounting rails.
 6. Cabinet shall have a vented plexiglass front door, perforated, metal rear door and flush mounted locks.
 7. 24W x 30"D x 84"H
 8. Cabinets shall be UL listed and black in color.
 9. Chatsworth Products, Adjustable Rail ServerRack Series, model 15253-703
- D. Cable Management:
1. Vertical cable management shall be provided as specified herein. Chatsworth Part #12096-703 (rack) and #34421-C01 (cabinet) or equal
 2. Horizontal cable management shall be provided as specified herein. Chatsworth Part #30530-719 or equal
- E. Horizontal Ladder Rack:
1. Horizontal ladder rack shall be provided.



2. Ladder rack shall be 18 inch wide UL Classified Cable Runway and provided with junctions, transitions, and mounting hardware as necessary. Ladder rack shall be fastened to equipment racks to provide extra support, and shall be properly grounded.
3. Chatsworth Part #11275-712, 11421-712, 10595-712, 11312-712, 12100-712 16301-701, 16302-701, #11440-004, 40164-001, 10642-001 and 10607-001 or equal

F. Grounding:

1. TGB
2. Chatsworth Part #13622-012 or equal

2.05 CATEGORY 6 PATCH PANELS

- A. Modular Patch Panels jack panels shall be provided in multiples of 48 port capacity for CCTV terminations.
- B. Leviton or equivalent

2.06 CATEGORY 6 MODULAR PATCH CORDS

- A. Patch cords will be equipped with identical modular 8-position plugs on both ends, wired straight through with standards compliant wiring.
- B. Be available in the following lengths and color(s): 7ft, yellow
- C. Molex or equal

2.07 FIBER PATCH PANELS

- A. Each fiber shelf shall be provided with connector panels and can accommodate UPC ST-type fiber connectors and splice trays. Must be available in the following sizes: 1RU, 4RU and 5RU
- B. Fiber shelves shall have easy access to internal fiber connections.
- C. Corning Manufactured and certified.

2.08 FIBER OPTIC CONNECTORS

- A. Provide field installable fusion splice, UPC and UPC ST type FTP. (Corning manufacture and certified)
- B. 24 strand SMF shall have the first 12 strands to every IDF terminated UPC ST type and the second 12 strands to every IDF terminated UPC SC type.

2.09 FIBER OPTIC PATCH CORDS

- A. Provide multi-mode laser optimized fiber patch cords. ST termination, 3-meter.
- B. Provide single-mode fiber patch cords. UPC ST termination, 3-meter.
- C. Provide single-mode fiber patch cords. UPC ST termination, 3-meter.
- D. Corning manufactured and certified.

2.10 FIBER OPTIC FAN-OUT KITS

- A. Not acceptable for termination.



PART 3 EXECUTION

3.01 SPECIAL REQUIREMENTS FOR CABLE ROUTING AND INSTALLATION

A. Cabling

1. All cabling shall bear appropriate markings for the environment in which they are installed.

B. Cable Pathway

1. Cable shall be placed in conduit or cable tray/J-hook system wherever possible.
2. Cable shall be separated and bundled by function, and placed in separate sections of the cable tray.
3. The Contractor shall adhere to the manufacturers' requirements for bend radius and pulling tension of all cables.
4. Contractor shall be responsible for inspecting cable pathways provided by others to assure proper accessibility is provided for installation, bonding, and grounding.
5. Cable shall be routed to avoid EMI/RFI interference from devices such as motors, transformers, ballast, relays, elevator equipment, and to avoid heat producing devices, sharp corners and other potentially harmful locations.
6. Cable run open above finished ceiling shall be neatly bundled and secured using removable Velcro tie-wraps approved by the cable manufacturer.

C. Installation

1. The system shall utilize a network of fiber optic, and unshielded twisted pair, coaxial and station cables.
2. Cables and terminations shall be provided and located as shown and in the quantities indicated.
3. All cables and terminations shall be identified at all locations.
4. All copper cable terminations shall comply with, and be tested to TIA/EIA 568A/B.1/B.2-1 standards for Category 6 installations.
5. Available and unused pairs shall be terminated and identified as spare at each location.
6. Station cables shall terminate on single-gang modular wall plates at the work area outlet.

3.02 OUTLET WIRING

- A. All outlet wiring shall be furnished and installed in accordance with manufacturer's recommendations and in compliance with all local, State and National codes.
- B. Station cables shall be installed in conduit in walls and above inaccessible ceilings, in cable tray /j-hook system in corridors and interstitial spaces, and on ladder rack.
- C. Station cable shall be routed at right angles to electrical power circuits and supported only from the building structure.



- D. Use of ceiling tiles, ductwork, pipes, grid, or hanger wires for support of TS cables is not acceptable.
- E. Contractor shall furnish and install supporting rings, hooks and other supporting hardware where necessary to support cabling.
- F. All supporting hardware shall be submitted and approved prior to installation.
- G. Cables shall not be laid upon finished ceilings or fastened to other building systems, conduit or piping.
- H. The contractor shall coordinate work activities and schedule with the general contractor, with other trades, and with the owner to assure on time project completion.

I. Cable Tray

- 1. The Contractor shall inspect the contract drawings, cable tray submittal, and cable tray installation and shall notify the owner's representative of any locations where EMI/RFI interference will prevent certification of the TS.
- 2. Where required for system certification - to avoid potential EMI/RFI interference - cable tray may be rerouted or permission granted to route cable outside of the cable tray.
- 3. Where cable is run outside of cable tray it shall be neatly bundled, and supported on "J" hooks or other suitable cable support devices.

3.03 SPECIAL REQUIREMENTS FOR CAMERA CABLING AND INSTALLATION

A. Cabling

- 1. All cabling shall bear appropriate markings for the environment in which they are installed.

B. Cable Pathway

- 1. Cable shall be placed in conduit or cable tray/J-hook system wherever possible.
- 2. Cable shall be separated and bundled by function, and placed in separate sections of the cable tray.
- 3. The Contractor shall adhere to the manufacturers' requirements for bend radius and pulling tension of all cables.
- 4. Contractor shall be responsible for inspecting cable pathways provided by others to assure proper accessibility is provided for installation, bonding, and grounding.
- 5. Cable shall be routed to avoid EMI/RFI interference from devices such as motors, transformers, ballast, relays, elevator equipment, and to avoid heat producing devices, sharp corners and other potentially harmful locations.
- 6. Cable run open above finished ceiling shall be neatly bundled and secured using removable Velcro tie-wraps approved by the cable manufacturer.

C. Installation



1. The system shall utilize a network of fiber optic, and unshielded twisted pair, coaxial and camera cables.
2. Cameras and mounts shall be provided and located as shown and in the quantities as indicated.
3. All cameras and camera types shall be identified at all locations.

3.04 TESTING AND COMMISSIONING

A. General

1. The contractor shall perform all tests and show proof with a paper and electronic copy of the fully functional surveillance system to include all telecommunications cabling certification test results.

B. Factory Testing

1. Submit all factory test results and factory procedures no later than system is to be integrated at the facility.

C. Commissioning

1. The contractor is to propose a full plan in writing to include the complete systems turnover to the owner. This procedure must outline personnel training and time to complete and turn the system over. It shall include dates of training the personnel and what type of training shall be help on that particular session.

3.05 WORKMANSHIP

- A. Components of the TS system shall be installed in a neat, workmanlike manner.
- B. Wiring schemes and terminations shall be uniform throughout the system.
- C. Identification markings shall be permanent, clearly readable and uniform.
- D. ANSI/TIA/EIA-568-A.1 or ANSI/TIA/EIA-568-B.1 and all companion standards shall be strictly adhered to throughout the installation.

END OF SECTION



SECTION 28 23 13
VIDEO SURVEILLANCE CONTROL AND MANAGEMENT SYSTEMS
BOSCH VIDOS 3.0 VIDEO MANAGEMENT SYSTEM SOFTWARE

PART 1- GENERAL

1.1 SUMMARY

- A. All equipment and materials shall be standard components that are regularly manufactured and utilized in the manufacturer's system.
- B. All equipment and components shall have been thoroughly tested and proven in actual use.
- C. All equipment and components shall be CE-marked, FCC, and TUV marked.
- D. Installation CDs or DVDs supplied with the system shall contain system documentation available in PDF format, and shall include the Acrobat Reader program.

PART 2- PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer:
Bosch Security Systems, Inc.
130 Perinton Parkway
Fairport, New York, 1450, USA
Phone: + 1 800 289 0096
Fax: + 1 585 223 9180
security.sales@us.bosch.com
www.boschsecurity.us
- B. Substitutions: Under provisions of Section 01 60 00.
 - 1. All proposed substitutions must be approved by the Engineer professional.
 - 2. Proposed substitutions must provide a line-by-line compliance documentation.
- C. The product specified shall be manufactured by a firm whose quality system is in compliance with the I.S./ISO 9001/EN 29001, QUALITY SYSTEM.

2.2 BOSCH VIDOS VIDEO MANAGEMENT SYSTEM GENERAL DESCRIPTION

- A. The product specified shall be the Bosch VIDOS Video Management System software package that runs on a non-proprietary PC workstation to provide the installation, administration, and operation of video surveillance systems using MPEG-2 and MPEG-4 video compression technology via local networks. The product searches and locates all Bosch transmitting and receiving stations (video servers and decoders), video monitors, and recording devices installed on the network, and then allows a system administrator to add these devices to the system configuration using an explorer style resource tree structure manage and construct a functional GUI observation center via the software. The software functionally operates as a virtual network video matrix system capable of 1) switching video to software monitors within the Vidos Management System window on the workstation and/or 2) displaying the pictures on analog CCTV monitors when compatible manufacturer recommended decoders are installed on the network. The software supports all Bosch MPEG-2 and/or MPEG-4 based hardware products as well as the Bosch Vidos-NVR Network Video Recorder.

- B. The VMS specified shall be an enterprise level software package that offers a complete video surveillance solution scalable from one to hundreds of cameras where each camera may be added on a unit-by-unit basis.
- C. The VMS shall support IP network connectivity, including LAN, WAN, VPN, Internet, and Wireless (WiFi and Cellular) technologies. The Bosch VIDOS VMS supports IP Multicast (UDP) and Unicast (TCP or UDP) video streaming and well as Multi-unicast.
- D. The minimum configuration of the PC or PCs running the Bosch Security Systems, Inc. VIDOS VMS software shall be:
 - The PC shall be based on a Pentium IV® 1.8 GHz or greater.
 - Minimum 256 MB of RAM
 - Network adapter 100 Mbit Ethernet
 - Standard sound card is optional and recommended.
 - Minimum 50 MB storage capacity for installation.
 - Windows XP Home/XP Professional.
 - DirectX 8.1 or better

2.3 BOSCH VIDEO MANAGEMENT SYSTEM (VMS) PRODUCT REQUIREMENTS

- A. The VMS specified shall provide, but not be limited to, the following functions:
 1. Search the local network for installed Bosch video servers (transmitters with connected cameras and receivers with connected monitors) and any Bosch installed network video recorders.
 2. Treat the network as a digital matrix system by allowing cameras to be connected to monitors using a drag and drop function.
 3. Display several simultaneous live picture connections from cameras in the network.
 4. Provide a configuration tool that allows the creation of site maps with camera locations and monitor placement and also allows interactive operation including PTZ control.
 5. Programming of alarm-triggered events.
 6. Programming of automatic video recording to network connected video recorders.
 7. Retrieve and playback the archived video from remote hard drives or Compact Flash memory of compatible devices or from network video recorders.
 8. Provides a bidirectional audio function to allow communication between remote camera sites and main control location. Full and half duplex audio communication modes are selectable.
- B. The product specified shall be a software program that provides the installation, administration, and operation of video surveillance systems using MPEG-2 and MPEG-4 video compression technology via local networks. The software scans the network and displays all the available installed Bosch video server and decoder devices and network video recorders, including their IP addresses and additional properties, in a window tree display. Video from any of the installed devices may then be displayed by dragging the device symbol into a workspace software monitor window. Video may be displayed in full screen mode or 2x2 and 3x3 multiscreen formats.
- C. The VMS shall support MPEG-2 and MPEG-4 products manufactured or recommended by Bosch Security Systems, Inc.
- D. The VMS shall be capable of simultaneously displaying MPEG-2 and MPEG-4 video streams in real time at bandwidths ranging from 10 Kb/sec to 4 Mb/sec in MPEG-4 and from 1.5 Mb/sec to 6 Mb/sec in MPEG-2, frame rates ranging from 1 fps to 30 fps and resolution ranging from QCIF to 4CIF.
- E. Each camera's bit rate, frame rate, and resolution shall be set independently from other cameras in the system, and altering these settings will not affect the recording or display

settings of other cameras.

- F. The VMS shall require a user name and password that determines the level of authorization as being a user or administrator of the video management system.
- G. The VMS shall provide control, via the workstation software monitors, of manufacturer recommended and properly configured pan/tilt/zoom cameras.
- H. Remote video servers equipped with a relay output function shall be controllable from the workstation running the Bosch VIDOS VMS software.
- I. The VMS shall have an instant replay function that allows video recorded on network devices equipped with local disk storage to be reviewed, and, if desired, backed up to network video recorders (NVR). The instant replay function shall be controlled via a slider bar and "VCR like" buttons.
- J. The VMS shall provide a function that automatically creates a logbook during every session in which all events and actions are recorded. The logbook may be viewed, searched using various filters, and the results saved as a text file.
- K. The VMS shall provide a camera overview function that shows at a glance thumbnail previews of available cameras in the system that may be dragged into a workspace software monitor.
- L. The VMS shall allow programming of camera sequences where pictures will be displayed one after the other on the display monitor. Salvo sequences may also be programmed where cameras are switched on selected monitors as a synchronized group.
- M. The VMS shall provide site map based operation, using a site map editor, that allows the user to create and view facility drawings on which camera icons and other system devices have been placed. Icons of all the devices, such as video servers, monitors, and functions such as alarm inputs or relay outputs that are available in the system may be placed within the site maps. Selection of an icon on a sitemap allows devices to be chosen, cameras to be displayed and controlled on monitors, and other site maps to be selected or linked from one site map to another. Existing drawings may also be imported into the software as bitmaps and then the icons added to the imported drawing. Graphic files with formats of .png, .bmp, .xbm, .xpm, .pnm, .jpeg, and .jpg may be imported into the system for use as site maps.
- N. Snapshots may be saved as .JPG format images to the hard drive of a computer running Windows XP. These .JPG images may then be printed, converted to another format, or placed into a word processing document.

2.4 ALARM HANDLING CAPABILITY

- A. The VMS specified shall handle alarms generated from the alarm interfaces of the Bosch video servers that have been integrated into the network with the video management system. In addition, the VMS is capable of combining the alarms generated from the alarm interfaces of the video servers with AND, NAND, OR, or NOR internal gating functions of the software to create new triggers that cause the VMS software to react according to preprogrammed alarm scenarios. Internal and weekly timers may be programmed to determine exactly when alarms can be active.
- B. The VMS shall accept input alarm triggers and then place them into an alarm stack to either be acknowledged or the input alarm may automatically trigger a series of system operations (scenarios).

- C. Alarm trigger inputs to the VMS may be caused by any of the following conditions at the remote video servers:
 - 1. Contact input
 - 2. Motion detection
 - 3. Video signal loss

2.5 NETWORK RECORDING CAPABILITY

- A. The VMS shall support Bosch Security Systems, Inc. Automatic Network Replenishment technology used when video is stored or backed up on network video recorders. In the event of network drop outs, missing sequences of video are automatically detected and recovered from the network hard drives or Compact Flash memory of the remote devices that are capable of locally storing video.
- B. The VMS shall allow playback of video recorded on the local drives of remote devices or video recorded on network video recorders. The software shall search the entire network for the recording devices and then display an overview of all recorded video that is available for playback review.
- C. The product specified shall be the VIDOS 3504/x Series Video Management System manufactured by Bosch Security Systems, Inc.

END OF SECTION

SECTION 28 23 16
VIDEO SURVEILLANCE MONITORING AND SUPERVISORY INTERFACES
BOSCH UML-262-90 PROFESSIONAL LARGE FULL HD LCD MONITOR

PART 1- GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Video Surveillance Monitoring and Supervisory Interfaces.
- B. Related Sections
 - 1. Section 28 23 13 - Video Surveillance Control and Management Systems.

1.2 REFERENCES

- A. Federal Communications Commission (FCC) (www.fcc.gov):
 - 1. FCC CFR 47 part 15 class A - Telecommunications - Radio Frequency Devices - Digital Device Emission.
- B. International Organization for Standardization (ISO):
 - 1. 9001 - Quality System.
- C. Japanese Norms:
 - 1. Conforms to Product Safety Electrical Appliance & Material (PSE) law
- D. Underwriters Laboratories, Inc. (UL) (www.ul.com):
 - 1. UL 60950-1 Information Technology Equipment - Safety.

1.3 DEFINITIONS

- A. LCD: A Liquid Crystal Display is a thin, flat display device made up of any number of color or monochrome pixels arrayed in front of a light source or reflector.
- B. Response Time: The minimum time necessary to change a pixel's color or brightness.
- C. S-video: Separate video, also known as Y/C, is an analogue video signal that carries the video data as two separate signals: brightness and color.
- D. Contrast Ratio: The ratio of the intensity of the brightest bright to the darkest dark.

1.4 SYSTEM DESCRIPTION

- A. Video Surveillance Monitoring and Supervisory Interfaces
 - 1. Bosch Professional Large Full HD LCD Monitor.
- B. Performance Requirements:
 - 1. The HD monitor shall support up to 1920 x 1080 full HD resolution.
 - 2. The HD monitor shall include an analog RGB, a digital DVI, a Y/C (S-video), a loop-through video, an audio, a digital HDMI input, and two BNC inputs.
 - 3. The HD monitor shall have a maximum contrast ratio of 4,000:1.
 - 4. The HD monitor shall include the picture-in-picture or split screen functions.
 - 5. The HD monitor shall include the Trigger and Auto Switch features.
 - 6. The HD monitor shall be capable of being mounted to a wall or placed on a desktop with a stand.

7. The HD monitor shall include a remote control device.
8. The HD monitor shall have a super high resolution of 600 TV Lines.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data:
 1. Manufacturer's data, user and installation manuals for all equipment and software programs including computer equipment and other equipment required for complete video management system.
- C. Shop Drawings; include
 1. System device locations on architectural floor plans.
 2. Full Schematic of system, including wiring information for all devices.
- D. Closeout Submittals
 1. User manual.
 2. Parts list.
 3. System device locations on architectural floor plans.
 4. Wiring and connection diagram.
 5. Maintenance requirements.

1.6 QUALITY ASSURANCE

- A. Manufacturer:
 1. Minimum of 10 years experience in manufacture and design Video Surveillance Devices.
 2. Manufacturer's quality system: Registered to ISO 9001 Quality Standard.
- B. Video Surveillance System:
 1. Listed by UL specifically for the required loads. Provide evidence of compliance upon request.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in manufacturer's original, unopened, undamaged containers; and unharmed original identification labels.
- B. Protect store materials from environmental and temperature conditions following manufacturer's instructions.
- C. Handle and operate products and systems according to manufacturer's instructions.
- D. Bosch provides off-the-shelf availability for our top selling products and same-day or 24-hour shipping.

1.8 WARRANTY

- A. Provide manufacturer's warranty.

1.9 MAINTENANCE

- A. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.

- B. Provide factory direct technical support from 8:00 a.m. to 8:00 p.m. via phone and e-mail.

PART 2- PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer:
Bosch Security Systems, Inc.
130 Perinton Parkway
Fairport, New York, 1450, USA
Phone: + 1 800 289 0096
Fax: + 1 585 223 9180
security.sales@us.bosch.com
www.boschsecurity.us
- B. Substitutions: Under provisions of Section 01 60 00.
 - 1. All proposed substitutions must be approved by the Engineer professional.
 - 2. Proposed substitutions must provide a line-by-line compliance documentation.

2.2 BOSCH PROFESSIONAL LARGE FULL HD LCD MONITOR UML-262-90

- A. The HD monitor shall support Full HD 1080p resolution.
- B. The HD monitor shall have a viewable picture area of 26 inches.
- C. The HD monitor shall provide 450 cd/m² luminance.
- D. The HD monitor shall provide a 4000:1 contrast ratio.
- E. The HD monitor shall have performance-enhancing features such as picture-in-picture, menu controls to adjust video features.
- F. The HD monitor shall have the following inputs:
 - 1. one analog RGB input.
 - 2. one looping Y/C (S-video) input.
 - 3. two looping composite video inputs.
 - 4. one looping audio input.
 - 5. two digital DVI inputs.
 - 6. one digital HDMI input.
 - 7. one trigger input.
- G. The HD monitor shall provide a front panel that allows the user to adjust image quality, brightness, size, position, and geometry for optimal viewing.
- H. The HD monitor shall provide a front panel control lockout feature so that only authorized users can adjust menu settings.
- I. The HD monitor shall have 178-degree horizontal and vertical viewing angles.
- J. The HD monitor shall automatically adapt to fluctuating electricity loads.
- K. The HD monitor shall follow the ISO 13406-2 standard.
- L. Electrical:
 - 1. Rated Voltage:
 - a. Monitor: 24 VDC, 5 A

- b. Power Adapter: 120/230 VAC, 50/60 Hz
 - 2. Voltage Range: 100–240 VAC, 50/50 Hz
 - 3. Frequency:
 - a. Horizontal: 60–73 KHz
 - b. Vertical: 47–63 Hz
 - 4. Power at Rated Voltage:
 - a. On: 70 W
 - b. Active Off: 1 W
- M. Video:
 - 1. Sync Format: PAL/NTSC
 - 2. LCD Panel: CCFL
 - 3. Viewable Picture Area: 26.02 in, measured diagonally
 - 4. Screen Size (H x V): 576 x 324 mm (22.68 x 12.76 in.)
 - 5. Pixel Pitch (H x V): 0.3 x 0.3 mm
 - 6. Resolution: 1920 x 1080 pixels, 600 TV lines typical
 - 7. Aspect Ratio: 16:9
 - 8. Display Colors: 16.7 million
 - 9. Response Time: 8 milliseconds (typical)
 - 10. Backlight: 50,000 hours (CCFL)
- N. LCD Panel Optical Characteristics
 - 1. Luminance: 450 cd/m² (typical)
 - 2. Contrast Ratio: 4000:1 (typical)
 - 3. Viewing Angle:
 - a. Horizontal: 178°
 - b. Vertical: 178°
- O. Connectors
 - 1. Video 1: Composite video (one BNC in, one BNC out)
 - 2. Video 2: Composite video (one BNC in, one BNC out)
 - 3. Digital: Two DVI-I in
 - 4. HDMI: One HDMI in
 - 5. VGA: One RGB 15-pin D-sub in
 - 6. Y/C (S-video): one mini-DIN, 4-pin in
 - 7. Audio: One RCA in (right/left)
 - 8. Trigger Input: One 1/8 in. mini phono plug
 - 9. Power Input: Mini-DIN 4P DC input jack
 - 10. Power Adapter:
 - a. Input: 100–240 VAC, 50/60 Hz
 - b. Output: 24 VDC, 5 A
- P. Mechanical:
 - 1. Cabinet Material: ABS plastic
 - 2. Finish: Black
 - 3. Mount: Wall mounting compatible with standard bracket
 - 4. VESA Mounting Compliance: 100 x 100 mm or 100 x 200 mm
 - 5. Dimensions:
 - a. Monitor: 632 x 388.1 x 211.1 mm (24.9 x 15.3 x 8.3 in.)
 - b. Monitor with Packaging: 722 x 544 x 302 mm (28.4 x 21.4 x 11.9 in.)
 - 6. Weight:
 - a. Monitor Weight: 11.3 kg (24.91 lb)
 - b. Shipping Weight: 14.0 kg (30.86 lb)
- Q. Environmental:
 - 1. Operating Temperature: 0° to 40°C (32° to 104°F)

2. Storage Temperature: -20° to 60°C (-4° to 140°F)
3. Humidity: Maximum 90% relative, non-condensing

2.3 ACCESSORIES

A. Mounts

1. Ceiling-mount bracket, Bosch UMM-LC-10B

PART 3- EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive devices and notify adverse conditions affecting installation or subsequent operation.
- B. Do not begin installation until unacceptable conditions are corrected.

3.2 PREPARATION

- A. Protect devices from damage during construction.

3.3 INSTALLATION

- A. Install devices in accordance with manufacturer's instruction at locations indicated on the floor drawings plans.
- B. Perform installation with qualified service personnel.
- C. Install devices in accordance with the National Electrical Code or applicable local codes.
- D. Ensure selected location is secure and offers protection from accidental damage.
- E. Location must provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.

3.4 FIELD QUALITY CONTROL

- A. Test snugness of mounting screws of all installed equipment.
- B. Test proper operation of all video system devices.
- C. Determine and report all problems to the manufacturer's customer service department.

3.5 ADJUSTING

- A. Make proper adjustment to video system devices for correct operation in accordance with manufacturer's instructions.
- B. Make any adjustment of camera settings to comply with specific customer's need.

3.6 DEMONSTRATION

- A. Demonstrate at final inspection that video management system and devices functions properly.

END OF SECTION

**SECTION 28 23 20
VIDEO SURVEILLANCE REMOTE DEVICES AND SENSORS
BOSCH INTUIKEY SERIES KEYBOARD**

PART 1- GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Video Surveillance Remote Devices.
- B. Related Sections
 - 1. Section 28 23 13 – Video Surveillance Control and Management Systems

1.2 REFERENCES

- A. Electromagnetic Compatibility
 - 1. Complies with ICES-003
 - 2. Complies with CE regulations
- B. Product Safety
 - 1. Complies with CE regulations.
 - 2. Complies with CSA, EN, and IEC standards.
- C. Federal Communications Commission (FCC) (www.fcc.gov)
 - 1. Complies with FCC Part 15
- D. International Organization for Standardization (ISO)
 - 1. 9001 – Quality System.
- E. Underwriters Laboratories, Inc. (UL) (www.ul.com)
 - 1. Complies with UL standards.

1.3 SYSTEM DESCRIPTION

- A. Video Surveillance Remote Devices
 - 1. Bosch IntuiKey Series Keyboard.
- B. Performance Requirements
 - 1. High-impact, vandal-resistant enclosure.
 - 2. Advanced CCD network camera.
 - 3. Ultra-compact size camera.
 - 4. High DVD-like quality MPEG-4.
 - 5. iSCSI recording.
 - 6. Storage efficient tri-streaming: dual MPEG-4 and JPEG.
 - 7. Power over Ethernet.
 - 8. Network video signals sent over IP networks.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data:
 - 1. Manufacturer's data, user and installation manuals for all equipment and software programs including computer equipment and other equipment required for complete

video management system.

- C. Shop Drawings; include
 - 1. System device locations on architectural floor plans.
 - 2. Full Schematic of system, including wiring information for all devices.
- D. Closeout Submittals
 - 1. User manual.
 - 2. Focus aid.
 - 3. Installation guide.
 - 4. CD-ROM with manual, software and tools.
 - 5. System device locations on architectural floor plans..
 - 6. Maintenance requirements.

1.5 QUALITY ASSURANCE

- A. Manufacturer:
 - 1. Minimum of 10 years experience in manufacture and design Video Surveillance Devices.
 - 2. Manufacturer's quality system: Registered to ISO 9001 Quality Standard.
- B. Video Surveillance System
 - 1. Listed by UL specifically for the required loads. Provide evidence of compliance upon request.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in manufacture's original, unopened, undamaged containers; and unharmed original identification labels.
- B. Protect store materials from environmental and temperature conditions following manufacturer's instructions.
- C. Handle and operate products and systems according to manufacturer's instructions.
- D. Bosch provides off-the-shelf availability for our top selling products and same-day or 24-hour shipping.

1.7 WARRANTY

- A. Provide manufacturer's warranty.

1.8 MAINTENANCE

- A. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.
- B. Provide factory direct technical support from 8:00 a.m. to 8:00 p.m. via phone and e-mail.

PART 2- PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer:
Bosch Security Systems, Inc.
130 Perinton Parkway

Fairport, New York, 1450, USA
Phone: + 1 800 289 0096
Fax: + 1 585 223 9180
security.sales@us.bosch.com
www.boschsecurity.us

- B. Substitutions: Under provisions of Section 01 60 00.
1. All proposed substitutions must be approved by the Engineer professional.
 2. Proposed substitutions must provide a line-by-line compliance documentation.

2.2 BOSCH INTUIKEY KEYBOARD - KBD-DIGITAL

A. General Characteristics

1. Designed for discrete surveillance.
2. High impact, ultra-compact vandal-resistant dome camera.
3. High-performance, 1/3 in. CCD network cameras.
4. Direct to iSCSI recording reduces costs eliminating the need for a network video recorder.
5. Storage efficient tri-streaming: dual MPEG-4 and JPEG simultaneously.
6. High quality MJPEG-4 compression for streaming video at low bit rates.
7. Minimizes bandwidth and storage requirements.
8. Analog monitoring video output and on-screen displays (OSD) to focus adjustment and network configuration.
9. Power over Ethernet (PoE) IEEE 802.3af compliant.
10. Delivers up to 25 and 30 images per second (PAL and NTSC) at 4CIF video resolution.
11. Intelligent Video Motion Detection (IVMD) license option.
12. Sends MPEG-4 stream to a video over IP decoder for viewing on a CVBS or VGA monitor.
13. NightSense (NWD-455 series) for 24-hour security.

B. Electrical

1. Operating Voltage: 12–15 VAC/DC (supplied by one or a combination of Allegiant switchers, Divar Digital Video Recorder, System4 Multiplexers, or optional power supply).
2. Power: 5 W nominal.
3. Allegiant Signal:
 - a. RS-485: 2-wire, 9600 Baud, 8 bits, no parity, 1 stop bit
 - b. RS-232: 3-wire, 9600 Baud, 8 bits, no parity, 1 stop bit
4. MUX/DVR Signal:
 - a. RS-485: 2-wire, 19,200 Baud, 8 bits, no parity, 1 stop bit
5. Terminal Mode Signal:
 - a. RS-232: 3 wire, 9600 Baud, 8 bits, no parity, 1 stop bit
6. Console Signal:
 - a. RS-232 RTS/CTS handshaking, 19,200/57600 Baud, 8 bits, no parity, 1 stop bit

C. Mechanical

1. Construction Finish: Charcoal
2. Dimensions (W x D x H): 327 x 190 x 75 mm (12.9 x 7.5 x 2.9 in.)
3. Weight: 1.1 kg (2.6 lb)
4. Allegiant Connector: RJ-11 data/power
5. Mux/DVR Connector: RJ-11 data/power
6. [Aux Power Connector: Bayonet plug]
7. Console Connector: Male, 9-pin D sub

D. Environmental

1. Enclosure: Splash-resistant

2. Temperature:
 - a. Operating: 0°C to 50°C (32°F to 122°F)
 - b. Storage: -20°C to 50°C (-4°F to 122°F)
 3. Relative Humidity: 10%–90%, non-condensing.
 4. 50/60 Hz, selectable flicker control.
- E. Compatibility
1. Bosch Allegiant Series Matrix Switcher: Backwards compatible with all systems using variable speed protocol (CPU firmware 5.3 and higher, released 6/94)
 2. Bosch Divar Digital Video Recorder: All models
 3. Bosch System4 Multiplexer: Backwards compatible with all System4 Multiplexers
 4. Bosch Video Management System (BVMS): Version 1.10 or later
 5. Bosch Vidos Video Management Software: Version 3.0 or later

PART 3– EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive devices and notify adverse conditions affecting installation or subsequent operation.
- B. Do not begin installation until unacceptable conditions are corrected.
- C. Ensure all parts are included in package.

3.2 PREPARATION

- A. Protect devices from damage during construction.
- B. Ensure operating temperature and humidity are within range accepted and recommended by manufacturer.

3.3 INSTALLATION

- A. Install devices in accordance with manufacturer's instruction at locations indicated on the floor drawings plans.
- B. Ensure selected location is secure and offers protection from accidental damage.
- C. Location must provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.

3.4 FIELD QUALITY CONTROL

- A. Test snugness of mounting screws of all installed equipment.
- B. Test proper operation of all video system devices.
- C. Determine and report all problems to the manufacturer's customer service department.

3.5 ADJUSTING

- A. Make proper adjustment to video system devices for correct operation in accordance with manufacturer's instructions.
- B. Make any adjustment of camera settings to comply with specific customer's need.

3.6 DEMONSTRATION

- A. Demonstrate at final inspection that video management system and devices function properly.
- B. Demonstrate at final inspection camera's functionality and video recording capabilities.

END OF SECTION



SECTION 28 23 25
VIDEO SURVEILLANCE REMOTE DEVICES AND SENSORS
BOSCH KBN AND KBE SERIES PREPACKAGED CAMERAS

PART 1- GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Security Lighting
- B. Related Sections
 - 1. Section 28 23 13 – Video Surveillance Control and Management Systems
 - 2. Section 28 23 16 – Video Surveillance Monitoring and Supervisory Interfaces

1.2 REFERENCES

- A. Federal Communications Commission (FCC) (www.fcc.gov)
 - 1. LTC 0435, LTC 0455, LTC 0485, LTC 0610, LTC 0498, LTC 0630, NBC-455, NBN-498:
Complies with FCC Part 15 Class B.
- B. International Electrotechnical Commission (IEC)
 - 1. Most Models:
IEC 60068-2-6 Vibration
 - 2. LTC 0630:
IEC 60068-2-27 Vibration.
- C. International Organization for Standardization (ISO)
 - 1. 9001 – Quality System.
- D. Underwriters Laboratories, Inc. (UL) (www.ul.com)
 - 1. LTC 0498, LTC 0630:
Complies with UL1950-1
 - 2. LTC 0630, NBC-455, NBN-498:
Complies with UL60950
 - 3. LTC 0435, LTC 0455, LTC 0485, LTC 0610:
Complies with UL6500 standards.

1.3 DEFINITIONS

- A. Privacy Masking: The ability to mask out a specific area to prevent it from being viewed in order to comply with privacy laws and particular site requirements.
- B. SensUp (sensitivity up): Increases camera sensitivity by increasing the integration time on the CCD (lowering shutter time from 1/50 to 1/5 s). This is accomplished by integrating the signal from a number of consecutive video fields to reduce signal noise.
- C. Automatic Gain Control (AGC): a process by which gain is automatically adjusted as a function of input or other specified parameter.
- D. Sensitivity: refers to the minimum level of light the CCD chip needs to generate an acceptable video picture, and is measured in lux.

1.4 SYSTEM DESCRIPTION

- A. Section Includes
 - 1. Video Surveillance Remote Devices
- B. Performance Requirements
 - 1. The Prepackaged Camera shall consist of a Bosch Dinion camera, a varifocal lens, a coax cable or Ethernet cable, and a power cable pre-wired into the housing.
 - 2. The Prepackaged Camera housing shall include a feed-through wall-mount.
 - 3. The Prepackaged Camera outdoor housings shall be rated to IP66 standards.
 - 4. The Prepackaged Camera shall feature Bilinx bi-directional communication for remote programming.
 - 5. The IP-enabled Prepackaged Cameras shall provide MPEG-4 video at up to 30 ips.
 - 6. The IP-enabled Prepackaged Cameras shall provide an Ethernet and BNC connectors for hybrid video transmission.
 - 7. The IP-enabled Prepackaged Cameras shall conform to the ONVIF standard.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data:
 - 1. Manufacturer's data, user and installation manuals for all equipment and software programs including computer equipment and other equipment required for complete video management system.
- C. Shop Drawings; include
 - 1. System device locations on architectural floor plans.
 - 2. Full Schematic of system, including wiring information for all devices.
- D. Closeout Submittals
 - 1. User manual.
 - 2. Parts list.
 - 3. System device locations on architectural floor plans.
 - 4. Wiring and connection diagram.
 - 5. Maintenance requirements.

1.6 QUALITY ASSURANCE

- A. Manufacturer:
 - 1. Minimum of 10 years experience in manufacture and design Video Surveillance Devices.
- B. Video Surveillance System:
 - 1. Listed by CSA.
 - 2. Certified compliant to FCC and CE for the required loads. Test methods are in accordance with Industry Canada and the IEC. Provide evidence of compliance upon request.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in manufacture's original, unopened, undamaged containers; and unharmed original identification labels.
- B. Protect store materials from environmental and temperature conditions following manufacturer's instructions.
- C. Handle and operate products and systems according to manufacturer's instructions.

- D. Bosch provides off-the-shelf availability for our top selling products and same-day or 24-hour shipping.

1.8 WARRANTY

- A. Provide manufacturer's warranty covering 3 years for replacement and repair of defective equipment.

1.9 MAINTENANCE

- A. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.
- B. Provide factory direct technical support from 8:00 a.m. to 8:00 p.m. via phone and e-mail.

PART 2- PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer:
Bosch Security Systems, Inc.
130 Perinton Parkway
Fairport, New York, 1450, USA
Phone: + 1 800 289 0096
Fax: + 1 585 223 9180
security.sales@us.bosch.com
www.boschsecurity.us
- B. Substitutions: Under provisions of Section 01 60 00.
 - 1. All proposed substitutions must be approved by the Engineer professional.
 - 2. Proposed substitutions must provide a line-by-line compliance documentation.

2.2 BOSCH KBE SERIES PREPACKAGED CAMERAS

- A. General Characteristics:
 - 1. The camera housing shall be constructed of an aluminum casing, neoprene gaskets, UV-resistant polymer end caps, and all stainless steel hardware. The viewing window shall be 3 mm (0.12 in.) thick UV-stabilized polycarbonate.
 - 2. A compatible feed-through wall mount shall be provided by the manufacturer that supports a maximum load of 20 lbs (9 kg). The mount shall have a swivel head that rotates 360° and tilts 180°. To ensure neatness of installation, the mount shall be designed to allow feed through wiring.
 - 3. The prepackaged outdoor camera unit shall meet IP66 and NEMA-4X enclosure protection standards.
 - 4. The prepackaged cameras shall provide a line-lock function that synchronizes the camera to the power line zero crossing to ensure roll-free switching when used with matrix or vertical interval switchers. The unit shall also have the capability to be switched to a crystal-lock mode that eliminates the camera's dependency on the utility power line frequency that can, in many installations, be noisy or unstable.
 - 5. The prepackaged cameras shall provide remote control and setup via Bosch Bilinx bi-directional, coaxial communication capability embedded in the video signal that allows change of camera settings, status checks, and firmware updates to be made from virtually anywhere along the video cable. The Bilinx communication shall use the standard coaxial video cable to transmit alarm and status messages. An optional USB

adapter and the software required for remote control and setup using Bilinx communication shall be available from the camera manufacturer.

- B. Outdoor IP-enabled Day/Night, 1/3 in. High Resolution: KBE-498V28-20N, KBE-498V28-20NV, KBE-498V75-20N, KBE-498V75-20NV
1. The product specified shall be a prepackaged camera unit designed for outdoor operation. The product, as delivered, shall be a complete system that includes a Bosch Dinion® camera with a 2.8-11 mm auto iris lens or a 7.5-50 mm auto iris lens pre-wired into a Bosch housing equipped with a heater, blower, and sunshield. The prepackaged outdoor cameras shall be pre-wired with 5 feet (1.5 m) of coaxial cable terminated with a female BNC connector, and 5 feet (1.5 m) of pre-wired 18AWG (1 mm²) 3-conductor power cable having flying leads. The IP prepackaged camera shall only be supplied with a pre-wired power cable with flying leads. All cables shall exit through the base of the housing. The prepackaged unit shall be supplied with a compatible feed-through wall mount. The prepackaged camera unit shall be designed to be fully operational between 21 to 28 VAC, 60 Hz and require 45 watts of power.
 2. The IP camera shall be a high-resolution, 1/3 in. format, Dinion IP Day/Night camera that produces 540 TV lines of horizontal resolution. The indoor prepackaged cameras shall be equipped with a factory back-focused 2.8-11 mm auto iris lens or a 7.5-50 mm varifocal, auto iris lens. NightSense technology automatically activates in low light conditions to switch the camera from color operation to monochrome mode and increases the sensitivity up to 9 dB.
 3. The IP camera shall be capable of capturing and storing images using H.264 and JPEG encoding and compression at 4CIF/D1 and CIF resolutions.
 4. The IP camera shall generate two independent H.264 streams and a JPEG stream simultaneously. Allow streaming high-quality images for live viewing while recording at a reduced frame rate and, at the same time, stream JPEG images to a remote PDA device.
- C. Camera:
1. Imager:
 - a. KBx-4xx: Interline transfer CCD 1/3-inch format
 2. Active Picture Elements (H x V):
 - a. KBx-498, KBx-630: 768-494
 3. Horizontal Resolution:
 - a. KBx-498, KBx-630: 540 TVL
- D. Sensitivity (3200K)
1. KBx-498V28N Series
 - a. Standard:
 - 1) 50 IRE: 0.65 lux (0.065 fc)
 - 2) 100 IRE: 2.6 lux (0.26 fc)
 - b. NightSense
 - 1) 50 IRE: 0.26 lux (0.026 fc)
 - 2) 100 IRE: 1.04 lux (0.104 fc)
 2. KBx-498V75N Series
 - a. Standard:
 - 1) 50 IRE: 0.65 lux (0.065 fc)
 - 2) 100 IRE: 2.6 lux (0.26 fc)
 - b. NightSense
 - 1) 50 IRE: 0.26 lux (0.026 fc)
 - 2) 100 IRE: 1.04 lux (0.104 fc)
- E. IP Video
1. Video Standards: MPEG-4, M-JPEG, H.264 (ISO/IEC 14496-10)
 2. Data Rate: 9.6 kbps to 6 Mbps constant and Variable

3. Overall IP delay: 240 ms
4. Resolution
 - a. 4CIF 925/30 ips): 704 x 576/480
 - b. CIF (25/30 ips): 352 x 288/240
5. Frame Rate:
 - a. 1 to 50/60 (PAL/NTSC): H.264
 - b. 1 to 25/30 (PAL/NTSC): M-JPEG
6. Network Protocols: RTP, Telnet, UDP, TCP, IP, HTTP, ICMP, HTTPS, FTP, DHCP, IGMP V2/V3, ARP, SMTP, SNMP, 802.1x, UPnP
7. Software Update: Flash ROM, remote programmable
8. Configuration: Using Web browser or Configuration Manager

F. Power

1. Outdoor Models:
 - a. IP-enabled Cameras (KBE-xxxVxx20N): 21 to 28 VAC, 60 Hz, 45 W
 - b. IP-enabled Cameras using PoE: IEEE 802.3af compliant (camera only; housing requires 40 W)

G. Mechanical

1. Weight (approx):
 - a. Outdoor Models: 4.1 kg (9.04 lb)
2. Construction: Aluminum housing casing, neoprene gaskets, UV-resistant polymer end caps, and all stainless steel hardware
3. Finish: Gray
4. Window: 3 mm (0.12 in.) thick UV-stabilized polycarbonate
5. Mounting: Four (4), 8 mm (5/16 in.) diameter fasteners (not included) are required for mounting

H. Feed-through Mount

1. Max Load: 9 kg (20 lb)
2. Size: 30 cm (12 in.)
3. Weight: 0.4 kg (0.9 lb)

I. Environmental:

1. Operating Temperature:
 - a. KBx-498Vxx-20N Series:
 - 20°C to +50°C (-4°F to +122°F) (non-IVA)
2. Storage Temperature:
 - a. KBx-498Vxx-20N and 20 NV Series:
 - 40°C to +70°C (-40°F to +158°F)
3. Operating Humidity:
 - a. KBx-498Vxx-20N Series:
 - 0% to 93% non-condensing
 - b. KBx-498Vxx-20N and 20 NV Series:
 - 20% to 93% RH
4. Storage Humidity:
 - a. KBx-498Vxx-20N and 20 NV Series:
 - up to 98% RH
5. Enclosure Protection: IP66, NEMA-4X

PART 3- EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive devices and notify adverse conditions affecting installation or

subsequent operation.

- B. Do not begin installation until unacceptable conditions are corrected.

3.2 PREPARATION

- A. Protect devices from damage during construction.

3.3 INSTALLATION

- A. Install devices in accordance with manufacturer's instruction at locations indicated on the floor drawings plans.
- B. Perform installation with qualified service personnel.
- C. Install devices in accordance with the National Electrical Code or applicable local codes.
- D. Ensure selected location is secure and offers protection from accidental damage.
- E. Location must provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.

3.4 FIELD QUALITY CONTROL

- A. Test snugness of mounting screws of all installed equipment.
- B. Test proper operation of all video system devices.
- C. Determine and report all problems to the manufacturer's customer service department.

3.5 ADJUSTING

- A. Make proper adjustment to video system devices for correct operation in accordance with manufacturer's instructions.
- B. Make any adjustment of camera settings to comply with specific customer's need.

3.6 DEMONSTRATION

- A. Demonstrate at final inspection that video management system and devices functions properly.

END OF SECTION

SECTION 28 23 26
VIDEO SURVEILLANCE REMOTE DEVICES AND SENSORS
BOSCH NDC-455 FLEXIDOME COLOR IP CAMERA

PART 1- GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Video Surveillance Remote Devices.
- B. Related Sections
 - 1. Section 28 23 13 – Video Surveillance Control and Management Systems.

1.2 REFERENCES

- A. Federal Communications Commission (FCC) (www.fcc.gov)
 - 1. FCC CFR 47 part 15 class B – Telecommunications – Radio Frequency Devices – Digital Device Emission.
- B. International Electrotechnical Commission (IEC)
 - 1. IEC 60068-2-6 Vibration.
- C. International Organization for Standardization (ISO)
 - 1. 9001 – Quality System.
- D. Underwriters Laboratories, Inc. (UL) (www.ul.com)
 - 1. UL1950-1 – Standard for Information Technology Equipment Including Electrical Business Equipment
 - 2. UL60950 – Information technology equipment. Safety. General requirements
- E. Water/Dust Protection
 - 1. IP 66
 - 2. NEMA 4X

1.3 DEFINITIONS

- A. **DiNion Imaging Technology:** An accurate 10-bit digital signal processing technology from Bosch that automatically activate the NightSense feature to extend sensitivity under low-light conditions by a factor of three in monochrome operation.
- B. **Privacy Masking:** The ability to mask out a specific area to prevent it from being viewed in order to comply with privacy laws and particular site requirements.
- C. **Tri-streaming:** A Bosch encoding technology that generates two separate H.264 video streams and one JPEG stream simultaneously. This advanced streaming capability enables the user to tune live viewing and recording requirements independently to meet specific site and enterprise requirements.
- D. **Back Light Compensation:** Selectively amplifies parts of the image to compensate for large contrast differences when only a portion of the image is brightly lit (e.g. a person in a sunlit doorway).

1.4 SYSTEM DESCRIPTION

- A. Video Surveillance Remote Devices
 - 1. NDC-455 FlexiDome Color IP Camera
- B. Performance Requirements
 - 1. 1/3-inch color CCD with progressive scan.
 - 2. Tri-streaming IP video: Simultaneous Dual H.264 streams and one M-JPEG stream.
 - 3. ONVIF compliant.
 - 4. High-impact, vandal-resistant enclosure (IP66/NEMA 4X).

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data:
 - 1. Manufacturer's data, user and installation manuals for all equipment and software programs including computer equipment and other equipment required for complete video management system.
- C. Shop Drawings; include
 - 1. System device locations on architectural floor plans.
 - 2. Full Schematic of system, including wiring information for all devices.
- D. Closeout Submittals
 - 1. User manual.
 - 2. Parts list.
 - 3. System device locations on architectural floor plans.
 - 4. Wiring and connection diagram.
 - 5. Maintenance requirements.

1.6 QUALITY ASSURANCE

- A. Manufacturer:
 - 1. Minimum of 10 years experience in manufacture and design Video Surveillance Devices.
 - 2. Manufacturer's quality system: Registered to ISO 9001 Quality Standard.
- B. Video Surveillance System
 - 1. Listed by UL specifically for the required loads. Provide evidence of compliance upon request.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in manufacturer's original, unopened, undamaged containers; and unharmed original identification labels.
- B. Protect store materials from environmental and temperature conditions following manufacturer's instructions.
- C. Handle and operate products and systems according to manufacturer's instructions.
- D. Bosch provides off-the-shelf availability for our top selling products and same-day or 24-hour shipping.

1.8 WARRANTY

- A. Provide manufacturer's warranty.

1.9 MAINTENANCE

- A. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.
- B. Provide factory direct technical support from 8:00 a.m. to 8:00 p.m. via phone and e-mail.

PART 2- PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer:
Bosch Security Systems, Inc.
130 Perinton Parkway
Fairport, New York, 1450, USA
Phone: + 1 800 289 0096
Fax: + 1 585 223 9180
security.sales@us.bosch.com
www.boschsecurity.us
- B. Substitutions: Under provisions of Section 01 60 00.
 - 1. All proposed substitutions must be approved by the Engineer professional.
 - 2. Proposed substitutions must provide a line-by-line compliance documentation.

2.2 BOSCH NDC-455 FLEXIDOME COLOR IP DOME CAMERAS NDC-455V03-21PS

- A. General Characteristics:
 - 1. The IP dome camera shall be a compact, high-impact rated, CCD color camera with progressive scan technology.
 - 2. The IP dome camera shall utilize 1/3-inch color CCD image sensor capable of producing up 540 TVL of resolution.
 - 3. The IP dome camera shall provide direct network connection using H.264 and JPEG compression and bandwidth throttling to efficiently manage bandwidth and storage requirements while delivering outstanding image quality.
 - 4. The IP dome camera shall offer Power over Ethernet (IEEE 802.3af Class 3) for indoor applications.
 - 5. The IP dome camera shall conform to the ONVIF standard.
 - 6. The user shall be able to view video on a PC using a Web browser, with the Bosch Video Management System, with VIDOS, or on an analog monitor with a Bosch video decoder.
 - 7. The IP dome camera shall provide MOTION+ video motion detection analysis system that provides basic video content analysis. Provide six distinct preprogrammed operational modes stored in the camera.
 - 8. The IP dome camera shall provide four independent, fully programmable privacy mask areas.
 - 9. The IP dome camera shall provide an on-screen display to simplify the camera/lens back focus and network configuration settings.
 - 10. The IP dome camera shall utilize the NightSense feature to extend sensitivity under low-light conditions by a factor of three in monochrome operation.
- B. Installation Requirements
 - 1. Shall contain a full-featured camera and integral varifocal lens.
 - 2. Shall be capable of being mounted to a surface, 4S (USA) electrical box, wall, corner, and suspended ceiling.

3. Shall provide power, video, and control via an Ethernet connection.
4. Shall provide power connections on flying leads.
5. Shall provide a built-in test pattern generator.
6. Shall provide a multi-language on-screen display.

C. IP Connectivity

1. The IP dome camera shall allow full camera control and configuration capabilities over the network.
2. The IP dome camera shall offer Power over Ethernet (IEEE 802.3af Class 3) for indoor applications.
3. The IP dome camera shall be capable of capturing and storing images using H.264 and JPEG encoding and compression at 4CIF/D1 and CIF resolutions.
4. The IP dome camera shall deliver DVD-quality 4CIF video, at rates up to 30 images per second, via TCP/IP over Shielded Cat5/Cat6 cable. Leverages bandwidth throttling and multicasting capabilities to manage bandwidth and storage requirements efficiently while delivering the best possible image quality and resolution.
5. The IP dome camera shall generate two independent H.264 streams and a JPEG stream simultaneously. Allow streaming high-quality images for live viewing while recording at a reduced frame rate and, at the same time, stream JPEG images to a remote PDA device.
6. The IP dome camera shall support iSCSI devices to allow video stream to be directly recorded to an iSCSI RAID array.
7. The IP dome camera shall conform to the ONVIF standard.

D. Alarm Handling Features:

1. Provide an alarm input that may be triggered by either a normally opened or normally closed contact.
2. Provide the capability on alarm to display up to a 17 character, programmable alarm message.
3. Provide a relay output that may be selected for normally opened or normally closed operation. The relay can be activated from an external alarm input to the camera, manual activation from the browser, upon video motion detection, or video loss.

E. Electrical:

1. Rated Voltage:
 - a. NDC-455Vxx-2xP:
 - 1) PoE
2. Current Consumption:
 - a. PoE: 200 mA

F. Sensor

1. Type: 1/3-inch CCD
2. Active Pixels:
 - a. NTSC: 768 x 494

G. IP Video

1. Standards: H.264 (ISO/IEC 14496-10), M-JPEG, JPEG
2. H.264 Profile: Main Profile and Baseline Profile
3. Streaming: Multiple, individually configurable streams in H.264 and JPEG, configurable frame rate and bandwidth
4. GOP Structure: I, IP
5. Data Rate: 9.6 kbps to 6 Mbps
6. Frame rate:
 - a. H.264: 1 to 50/60 (PAL/NTSC)
 - b. M-JPEG: 1 to 25/30 (PAL/NTSC)
7. Resolution:
 - a. 4CIF: 704 x 576/480 (25/30 ips)

- b. CIF: 352 x 288/240 (25/30 ips)

H. Video Out

- 1. Signal: Analog composite (NTSC or PAL) for service
- 2. Connector: 2.5 mm jack, 75 Ohm
- 3. Horizontal resolution: 540 TVL
- 4. Video S/N: 50 dB

I. Sensitivity (3200 K ,89% Scene Reflectivity)

- 1. Full Video (100 IRE)
 - a. Color: 2.6 lx (0.26 fc)
 - b. NightSense: 1.04 lx (0.104 fc)
- 2. Usable Picture (50 IRE):
 - a. Color: 0.65 lx (0.065 fc)
 - b. NightSense: 0.26 lx (0.026 fc)
- 3. Usable Picture (30 IRE):
 - a. Color: 0.30 lx (0.03 fc)
 - b. NightSense: 0.012 lx (0.0012 fc)

J. Video

- 1. Dynamic Range: 60 dB
- 2. Image processing : 10-bit processing
- 3. BLC: Center window weighting
- 4. Signal-to-Noise Ratio: 50 dB
- 5. White Balance:
 - a. ATW
 - b. ATW hold and manual (2500 to 10000K)
- 6. Auto Black: Automatic continuous, Off
- 7. NightSense: Adjustable from Off to up to 10x
- 8. Synchronization:
 - a. Internal
 - b. Line Lock
- 9. Shutter:
 - a. Auto (1/50 [1/60] to 1/10000) selectable
 - b. Auto (1/50 [1/60] to 1/50000) automatic flickerless, fixed selectable
- 10. Sensitivity Up: Adjustable from Off to 10x
- 11. Test Pattern Generator:
 - a. Color bars 100%
 - b. Grayscale 11-step
 - c. Sawtooth 2H
 - d. Checker board
 - e. Cross hatch
 - f. UV plane
- 12. Video Motion Analysis: Motion+ or IVA
- 13. Privacy Masking: 4 independent areas, fully programmable
- 14. Controls: OSD with softkey operation

K. Audio

- 1. Standard G.711: 300 Hz to 3.4 kHz at 8 kHz sampling rate
- 2. Signal-to-Noise Ratio: > 50 dB

L. Input/Output Ports

- 1. Audio: 1 x mono line in, 1 x mono line out
 - a. Signal Line In: 9 kohm typical, 5.5 Vpp max.
 - b. Signal Line Out:
 - 1) 3.0 Vpp at 10 ohm typical

- 2) 2.3 Vpp at 32 ohm typical
 - 3) 1.7 Vpp at 16 ohm typical
 - 2. Alarm: 2 inputs
 - a. Activation Voltage : + 5 VDC to + 40 VDC
 - 3. Relay: 1 output
 - a. Signal: 30 VAC or + 40 VDC Max 0.5 A continuous , 10VA
- M. Software Control
- 1. Unit Configuration: Via Web browser or Configuration Manager
 - 2. Motion Detection: On/Off
 - 3. Flicker Control: 50/60 Hz, selectable
 - 4. Software Update: Flash ROM, remote programmable
- N. Network
- 1. Protocols: RTP, Telnet, UDP, TCP, IP, HTTP, HTTPS, FTP, DHCP, IGMP V2/V3, ICMP, ARP, SMTP, SNTP, SNMP, 802.1x, UPnP
 - 2. Encryption: TLS 1.0, SSL, AES (optional)
 - 3. Ethernet: 10/100 Base-T, auto-sensing, half/full duplex, RJ45
 - 4. Power over Ethernet: IEEE 802.3af compliant
- O. Optical
- 1. Varifocal Lens: IR-corrected, manual zoom and focus adjustment
 - 2. Iris Control: Automatic Iris control
 - 3. Viewing Angle (H x V):
 - a. 2.8 to 10 mm:
 - 1) Wide 100.8° x 73.7°
 - 2) Tele: 28.5° x 21.4°
 - b. 9 to 22 mm
 - 1) Wide 31.2° x 22.8°
 - 2) Tele: 12.8° x 9.6°
- P. Mechanical:
- 1. Weight: 800 g (1.76 lb)
 - 2. Mounting: Flush mount or surface mount
 - 3. Color:
 - a. Trim ring: White (RAL91010)
 - b. Inner Liner: Black
 - 4. Adjustment range:
 - a. Pan: 360°
 - b. Tilt: 90°
 - c. Azimuth: ±90°
 - 5. Construction:
 - a. Dome bubble: Polycarbonate, clear with UV blocking anti-scratch coating
 - b. Trim ring: Aluminum
- Q. Environmental:
- 1. Operating Temperature Range, with heater off: -20° to 50°C (-4° to 122°F)
 - 2. Operating Temperature Range, with heater on: -50° to 50°C (-58° to 122°F)
 - 3. Storage Temperature Range: -50° to 70°C (-58° to 158°F)
 - 4. Operating Humidity: 5% to 93% relative humidity
 - 5. Storage Humidity: Up to 98% relative humidity
 - 6. Impact Protection:
 - a. IEC 60068-2-75 test Eh, 50 J
 - b. EN 50102, exceeding IK 10
 - 7. Water/Dust Protection;
 - a. IP 66

- b. NEMA 4X
- 8. Vibration;
 - a. IEC60068-2-6

2.3 ACCESSORIES

- A. Mounts/Components
 - 1. VDA-455SMB Surface Mount
 - 2. VDA-455TBL Tinted Bubble
 - 3. VDA-455CBL Clear Bubble
 - 4. S1460 Service/Monitor Cable
- B. Power Supplies
 - 1. UPA-2410-60 Power Supply
 - 2. UPA-2430-60 Power Supply
 - 3. UPA-2450-60 Power Supply
 - 4. UPA-2420-50 Power Supply
 - 5. UPA-2450-50 Power Supply
- C. Software Options
 - 1. MVC-FIVA4-CAM IVA License
 - 2. MVC-FENC-AES BVIP AES 128 bit Encryption License

PART 3- EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive devices and notify adverse conditions affecting installation or subsequent operation.
- B. Do not begin installation until unacceptable conditions are corrected.

3.2 PREPARATION

- A. Protect devices from damage during construction.

3.3 INSTALLATION

- A. Install devices in accordance with manufacturer's instruction at locations indicated on the floor drawings plans.
- B. Ensure selected location is secure and offers protection from accidental damage.
- C. Location must provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.

3.4 FIELD QUALITY CONTROL

- A. Test snugness of mounting screws of all installed equipment.
- B. Test proper operation of all video system devices.
- C. Determine and report all problems to the manufacturer's customer service department.

3.5 ADJUSTING

- A. Make proper adjustment to video system devices for correct operation in accordance with manufacturer's instructions.
- B. Make any adjustment of camera settings to comply with specific customer's need.

3.6 DEMONSTRATION

- A. Demonstrate at final inspection that video management system and devices function properly.

END OF SECTION

SECTION 28 23 27
VIDEO SURVEILLANCE REMOTE DEVICES AND SENSORS
BOSCH NDN-498 SERIES FLEXIDOME 2X DAY/NIGHT IP CAMERAS

PART 1- GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Video Surveillance Remote Devices.
- B. Related Sections
 - 1. Section 28 23 13 – Video Surveillance Control and Management Systems
 - 2. Section 28 23 16 – Video Surveillance Monitoring and Supervisory Interfaces

1.2 REFERENCES

- A. Federal Communications Commission (FCC) (www.fcc.gov)
 - 1. FCC CFR 47 part 15 class B – Telecommunications – Radio Frequency Devices – Digital Device Emission.
- B. International Electrotechnical Commission (IEC)
 - 1. IEC 60068-2-6
 - 2. IEC 60068-2-75 test Eh, 50 J
- C. International Organization for Standardization (ISO)
 - 1. 9001 – Quality System
- D. Underwriters Laboratories, Inc. (UL) (www.ul.com)
 - 1. UL1950-1 Standard for Information Technology Equipment Including Electrical Business Equipment
 - 2. UL60950 – Information technology equipment. Safety. General requirements
- E. Water/Dust Protection
 - 1. IP 66
 - 2. NEMA 4X

1.3 DEFINITIONS

- A. Day/Night (infrared sensitive): A camera that has normal color operation in situations where there is sufficient illumination (day conditions), but where the sensitivity can be increased when there is little light available (night conditions). This is achieved by removing the infrared cut filter required for good color rendition. The sensitivity can be further enhanced by integrating a number of fields to improve the signal-to-noise ratio of the camera (this may introduce motion blur).
- B. Privacy Masking: The ability to mask out a specific area to prevent it from being viewed in order to comply with privacy laws and particular site requirements.
- C. SensUp (sensitivity up): Increases camera sensitivity by increasing the integration time on the CCD (lowering shutter time from 1/50 s to 1/5 s – PAL; 1/60 s to 1/6 s - NTSC). This is accomplished by integrating the signal from a number of consecutive video fields to reduce signal noise.
- D. Smart BLC (Back Light Compensation): Smart back-light compensation allows the camera to

automatically compensate for bright areas of a high contrast scene without having to define a window or area.

1.4 SYSTEM DESCRIPTION

- A. Video Surveillance Remote Devices
 - 1. NDN-498 Series FlexiDome2X Day/Night IP Dome Camera
- B. Performance Requirements
 - 1. 1/3-inch day/night CCD with progressive scan.
 - 2. 20-bit image processing technology.
 - 3. Wide Dynamic Range, 2X-dynamic engine and SmartBLC
 - 4. Tri-streaming IP video: Simultaneous Dual H.264 streams and one M-JPEG stream
 - 5. ONVIF compliant.
 - 6. High-impact, vandal-resistant enclosure.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data:
 - 1. Manufacturer's data, user and installation manuals for all equipment and software programs including computer equipment and other equipment required for complete video management system.
- C. Shop Drawings; include
 - 1. System device locations on architectural floor plans.
 - 2. Full Schematic of system, including wiring information for all devices.
- D. Closeout Submittals
 - 1. User manual.
 - 2. Parts list.
 - 3. System device locations on architectural floor plans.
 - 4. Wiring and connection diagram.
 - 5. Maintenance requirements.

1.6 QUALITY ASSURANCE

- A. Manufacturer:
 - 1. Minimum of 10 years experience in manufacture and design Video Surveillance Devices.
 - 2. Manufacturer's quality system: Registered to ISO 9001 Quality Standard.
- B. Video Surveillance System
 - 1. Listed by UL specifically for the required loads. Provide evidence of compliance upon request.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in manufacturer's original, unopened, undamaged containers; and unharmed original identification labels.
- B. Protect store materials from environmental and temperature conditions following manufacturer's instructions.
- C. Handle and operate products and systems according to manufacturer's instructions.

- D. Bosch provides off-the-shelf availability for our top selling products and same-day or 24-hour shipping.

1.8 WARRANTY

- A. Provide manufacturer's warranty.

1.9 MAINTENANCE

- A. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.
- B. Provide factory direct technical support from 8:00 a.m. to 8:00 p.m. via phone and e-mail.

PART 2- PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer:
[Bosch Security Systems, Inc.
130 Perinton Parkway
Fairport, New York, 1450, USA
Phone: + 1 800 289 0096
Fax: + 1 585 223 9180
security.sales@us.bosch.com
www.boschsecurity.us
- B. Substitutions: Under provisions of Section 01 60 00.
 - 1. All proposed substitutions must be approved by the Engineer professional.
 - 2. Proposed substitutions must provide a line-by-line compliance documentation.

2.2 BOSCH NDN-498 FLEXIDOME 2X DAY/NIGHT IP DOME CAMERAS NDN-498V03-21PS

- A. General Characteristics:
 - 1. The IP dome camera shall be a high-impact, vandal-resistant, CCD camera with 20-bit digital signal processing (DSP).
 - 2. The IP dome camera shall utilize 1/3-inch day/night CCD image sensor capable of producing up 540 TVL of resolution.
 - 3. The IP dome camera shall provide direct network connection using H.264 and JPEG compression and bandwidth throttling to efficiently manage bandwidth and storage requirements while delivering outstanding image quality.
 - 4. The IP dome camera shall offer Power over Ethernet (IEEE 802.3af Class 3) for indoor applications.
 - 5. The IP dome camera shall conform to the ONVIF standard.
 - 6. The user shall be able to view video on a PC using a Web browser, with the Bosch Video Management System, with VIDOS, or on an analog monitor with a Bosch video decoder.
 - 7. The IP dome camera shall provide MOTION+ video motion detection analysis system that provides basic video content analysis.
 - 8. The IP dome camera shall provide protection against water and dust up to IP 66 (NEMA 4X) standards.
 - 9. The IP dome camera shall provide a cast-aluminum housing, polycarbonate dome and hardened inner liner able to withstand the equivalent of 55 kg (120 lbs) of force.

10. The IP dome camera shall provide six distinct preprogrammed operational modes stored in the camera.
11. The IP dome camera shall provide four independent, fully programmable privacy mask areas.
12. The IP dome camera shall provide an on-screen display to simplify the camera/lens back focus and network configuration settings.
13. The IP dome camera shall provide a lens wizard during lens back focus setup to allow focusing at maximum lens opening to ensure that the object of interest within the field of view always remains in focus.
14. The IP dome camera shall provide a feature (SensUP) that enhances camera sensitivity by increasing the integration time on the CCD (lowering shutter time from 1/50 s to 1/5 s – PAL; 1/60 s to 1/6 s - NTSC). This is accomplished by integrating the signal from a number of consecutive video fields to reduce signal noise.
15. The IP dome camera shall provide a frame integration mode (Bosch SensUp feature) that can produce a color image with a minimum scene illumination of 0.248 lux (0.023 fc) and a monochrome image, when in the night mode, with a minimum illumination of 0.1 lux (0.0093 fc).
16. The IP dome camera shall provide enhanced night viewing through the increase of IR sensitivity by automatically switching a motorized IR filter from color to monochrome operation in low-light or IR illuminated applications. Allow the IR filter to be switched manually via the alarm input, preprogrammed in a camera mode or profile.
17. The IP dome camera shall utilize 2X-Dynamic technology to extend the dynamic range of the camera to provide a sharper, more detailed image for increased accuracy in color reproduction in harsh lighting conditions.
18. The IP dome camera shall utilize pixel-by-pixel analysis to automatically compensate for bright areas of a high contrast scene (Back light) without having to define a window or area.
19. Backlight compensation shall work in conjunction with dynamic range.
20. The IP dome camera shall utilize AutoBlack technology to adjust the black level of the image so as to maximize the contrast.

B. Installation Requirements

1. Shall contain a full-featured camera and integral varifocal lens.
2. Shall be capable of being mounted to a surface, 4S (USA) electrical box, wall, corner, and suspended ceiling.
3. Shall provide power, video, and control via an Ethernet connection.
4. Shall provide power connections on flying leads.
5. Shall provide a built-in test pattern generator.
6. Shall provide a multi-language on-screen display.

C. IP Connectivity

1. The IP dome camera shall allow full camera control and configuration capabilities over the network.
2. The IP dome camera shall offer Power over Ethernet (IEEE 802.3af Class 3) for indoor applications.
3. The IP dome camera shall be capable of capturing and storing images using H.264 and JPEG encoding and compression at 4CIF/D1 and CIF resolutions.
4. The IP dome camera shall deliver DVD-quality 4CIF video, at rates up to 30 images per second, via TCP/IP over Cat5/Cat6 UTP cable. Leverages bandwidth throttling and multicasting capabilities to manage bandwidth and storage requirements efficiently while delivering the best possible image quality and resolution.
5. The IP dome camera shall generate two independent H.264 streams and a JPEG stream simultaneously. Allow streaming high-quality images for live viewing while recording at a reduced frame rate and, at the same time, stream JPEG images to a remote PDA device.
6. The IP dome camera shall support iSCSI devices to allow a network-enabled

- AutoDome to stream video directly to an iSCSI RAID array.
7. The IP dome camera shall conform to the ONVIF standard.

D. Alarm Handling Features:

1. The IP dome camera shall provide an alarm input that may be triggered by either a normally opened or normally closed contact.
2. The IP dome camera shall provide the capability on alarm to display up to a 31 character, programmable alarm message.
3. The IP dome camera shall provide a relay output that may be selected for normally opened or normally closed operation. The relay can be activated from an external alarm input to the camera, manual activation from the browser, upon video motion detection, or video loss.

E. Electrical:

1. Rated Voltage:
 - a. NDN-498Vxx-2xP
 - 1) PoE
2. Current Consumption:
 - a. PoE: 200 mA

F. Sensor

1. Type: 1/3-inch CCD, WDR, dual shutter
2. Active Pixels:
 - a. NTSC: 768 x 494

G. IP Video

1. Standards: H.264 (ISO/IEC 14496□10), M□JPEG, JPEG
2. H.264 Profile: Main Profile and Baseline Profile
3. Streaming: Multiple, individually configurable streams in H.264 and JPEG, configurable frame rate and bandwidth
4. GOP Structure: I, IP, IPBB
5. Data Rate: 9.6 kbps to 6 Mbps
6. Frame rate:
 - a. H.264: 1 to 50/60 (PAL/NTSC)
 - b. M-JPEG: 1 to 25/30 (PAL/NTSC)
7. Resolution:
 - a. 4CIF: 704 x 576/480 (25/30 ips)
 - b. CIF: 352 x 288/240 (25/30 ips)

H. Video Out

1. Signal: Analog composite (NTSC or PAL) for service
2. Connector: 2.5 mm jack, 75 Ohm
3. Horizontal resolution: 540 TVL
4. Video S/N: 50 dB

I. Sensitivity

1. NDN-498V03 (F1.2)
 - a. Full Video (100 IRE)
 - 1) Color: 2.48 lx (0.23 fc)
 - 2) Color + SensUP 10 x: 0.248 lx (0.023 fc)
 - 3) Monochrome: 1.01 lx (0.093 fc)
 - 4) Monochrome + SensUP 10x: 0.1 lx (0.0093 fc)
 - b. Usable Picture (50 IRE):
 - 1) Color: 0.621 lx (0.058 fc)
 - 2) Color + SensUP 10 x: 0.062 lx (0.0058 fc)
 - 3) Monochrome: 0.23 lx (0.021 fc)

- 4) Monochrome + SensUP 10x: 0.023 lx (0.0021 fc)
- c. Usable Picture (30 IRE):
 - 1) Color: 0.28 lx (0.027 fc)
 - 2) Color + SensUP 10 x: 0.028 lx (0.0027 fc)
 - 3) Monochrome: 0.099 lx (0.0092 fc)
 - 4) Monochrome + SensUP 10x: 0.0099 lx (0.00092 fc)

J. Video

1. Horizontal Resolution: 540 TVL
2. Signal-to-Noise Ratio: >50 dB
3. Video Output: Composite video 1 Vpp, 75 Ohm
4. Synchronization:
 - a. Internal
 - b. Line Lock
 - c. HV-lock
 - d. Genlock (Burst Lock)
5. Shutter:
 - a. Auto (1/50 [1/60] to 1/10000) selectable
 - b. Auto (1/50 [1/60] to 1/150000) automatic flickerless, fixed selectable
6. Sensitivity Up: Adjustable from Off to 10x
7. Day/Night: Color, Mono, Auto
8. Auto Black: Automatic continuous, Off
9. Dynamic Engine:
 - a. 2X-dynamic
 - b. XF-dynamic
 - c. SmartBLC+2X dynamic
10. Dynamic Range: 120 dB (20-bit image processing)
11. Image processing : 20-bit processing
12. Dynamic Noise Reduction: Auto, On/Off selectable
13. Sharpness: Level selectable
14. SmartBLC: On (includes 2X-dynamic) / Off
15. AGC: On or Off (0 – 30 dB) selectable
16. Peak White Invert: On/Off
17. White Balance:
 - a. ATW
 - b. ATW hold and manual (2500 to 10000K)
18. Cable Compensation: Up to 1000 m (3000 ft) coax without external amplifiers
19. Camera ID: 17-character editable string, position selectable
20. Test Pattern Generator:
 - a. Color bars 100%
 - b. Grayscale 11-step
 - c. Sawtooth 2H
 - d. Checker board
 - e. Cross hatch
 - f. UV plane
21. Modes: 6 preset programmable modes
22. Privacy Masking: 4 independent areas, fully programmable
23. Controls: OSD with softkey operation

K. Alarms

1. Alarm Output: Relay
2. Alarm Input (TTL): Profile switching, +3.3 V nominal, +40 VDC max.
3. Alarm Output Relay: 30 VAC or +40 VDC, max. 0.5 A continuous, 10 VA
4. External Synchronization Input: 75 Ohm or high impedance selectable

L. Audio

1. Standard G.711: 300 Hz to 3.4 kHz at 8 kHz sampling rate
2. Signal-to-Noise Ratio: > 50 dB

M. Input/Output

1. Audio: 1 x mono line in, 1 x mono line out
 - a. Signal Line In: 9 kohm typical, 5.5 Vpp max.
 - b. Signal Line Out:
 - 1) 3.0 Vpp at 10 ohm typical
 - 2) 2.3 Vpp at 32 ohm typical
 - 3) 1.7 Vpp at 16 ohm typical
2. Alarm
 - a. Activation Resistance: 10 ohm max.
3. Relay: 1 output
 - a. Signal: 30 Vpp (SELV), 0.2 A
4. Data: RS-232/422/485

N. Software Control

1. Unit Configuration: Via Web browser or Configuration Manager
2. Motion Detection: On/Off
3. Flicker Control: 50/60 Hz, selectable
4. Software Update: Flash ROM, remote programmable

O. Network

1. Protocols: RTP, Telnet, UDP, TCP, IP, HTTP, HTTPS, FTP, DHCP, IGMP V2/V3, ICMP, ARP, SMTP, SNTP, SNMP, 802.1x
2. Encryption: TLS 1.0, SSL, AES (optional)
3. Ethernet: 10/100 Base-T, auto-sensing, half/full duplex, RJ45
4. Power over Ethernet: IEEE 802.3af compliant

P. Optical

1. Varifocal Lens: IR-corrected, manual zoom, and focus adjustment
2. Iris Control: Automatic Iris control
3. Viewing Angle (H x V):
 - a. 2.8 to 10 mm:
 - 1) Wide 100.8° x 73.7°
 - 2) Tele: 28.5° x 21.4°
 - b. 9 to 22 mm:
 - 1) Wide 31.2° x 22.8°
 - 2) Tele: 12.8° x 9.6°

Q. Mechanical:

1. Weight: 740 g (1.63 lb)
2. Mounting: Flush mount or surface mount
3. Color:
 - a. Trim ring: White (RAL91010)
 - b. Inner Liner: Black
4. Adjustment range:
 - a. Pan: 360°
 - b. Tilt: 90°
 - c. Azimuth: ±90°
5. Construction:
 - a. Dome bubble: Polycarbonate, clear with UV blocking anti-scratch coating
 - b. Trim ring: Aluminum

R. Environmental:

1. Operating Temperature Range, with heater off: -30° to 50°C (-22° to 122°F)

2. Operating Temperature Range, with heater on: -50° to 50°C (-58° to 122°F)
3. Storage Temperature Range: -55° to 70°C (-67° to 158°F)
4. Operating Humidity: 5% to 93% relative humidity
5. Storage Humidity: Up to 98% relative humidity
6. Impact Protection:
 - a. IEC 60068-2-75 test Eh, 50 J
 - b. EN 50102, exceeding IK 10
7. Water/Dust Protection;
 - a. IP 66
 - b. NEMA 4X
8. Vibration:
 - a. IEC60068-2-6

2.3 ACCESSORIES

- A. Mounts/Components
 1. VDA-455SMB Surface Mount
 2. VDA-455TBL Tinted Bubble
 3. VDA-455CBL Clear Bubble
 4. S1460 Service/Monitor Cable
- B. Power Supplies
 1. UPA-2410-60 Power Supply
 2. UPA-2430-60 Power Supply
 3. UPA-2450-60 Power Supply
 4. UPA-2420-50 Power Supply
 5. UPA-2450-50 Power Supply
- C. Software Options
 1. MVC-FIVA4-CAM IVA License
 2. MVC-FENC-AES BVIP AES 128 bit Encryption License

PART 3- EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive devices and notify adverse conditions affecting installation or subsequent operation.
- B. Do not begin installation until unacceptable conditions are corrected.

3.2 PREPARATION

- A. Protect devices from damage during construction.

3.3 INSTALLATION

- A. Install devices in accordance with manufacturer's instruction at locations indicated on the floor drawings plans.
- B. Ensure selected location is secure and offers protection from accidental damage.
- C. Location must provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.

3.4 FIELD QUALITY CONTROL

- A. Test snugness of mounting screws of all installed equipment.

- B. Test proper operation of all video system devices.
- C. Determine and report all problems to the manufacturer's customer service department.

3.5 ADJUSTING

- A. Make proper adjustment to video system devices for correct operation in accordance with manufacturer's instructions.
- B. Make any adjustment of camera settings to comply with specific customer's need.

3.6 DEMONSTRATION

- A. Demonstrate at final inspection that video management system and devices function properly.

END OF SECTION



SECTION 28 23 28
VIDEO SURVEILLANCE REMOTE DEVICES AND SENSORS
BOSCH EX36MNX IP INTEGRATED DAY NIGHT CORNER MOUNT CAMERA

PART 1- GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Security Lighting
- B. Related Sections
 - 1. Section 28 23 13 – Video Surveillance Control and Management Systems
 - 2. Section 28 23 16 – Video Surveillance Monitoring and Supervisory Interfaces

1.2 REFERENCES

- A. Federal Communications Commission (FCC) (www.fcc.gov)
 - 1. Complies with FCC Part 15.
- B. Underwriters Laboratories, Inc. (UL) (www.ul.com)
 - 1. UL Std No 50 - Enclosures for Electrical Equipment.
 - 2. UL Std No 2044 - Commercial CCTV Equip. Applicable Health Care Facility Requirements.

1.3 DEFINITIONS

- A. Infrared Illuminator: a light source working in the infrared frequency range is called an infrared illuminator.
- B. Automatic Gain Control (AGC): a process by which gain is automatically adjusted as a function of input or other specified parameter.
- C. Sensitivity: refers to the minimum level of light the CCD chip needs to generate an acceptable video picture, and is measured in lux.
- D. Shutter Speed: speed at which the CCD chip can read out the charge. Using either dipswitches or a surveillance camera's menu (if one has been built in), the default setting of 1/50 sec (PAL) or 1/60 sec (NTSC) can be increased up to 1/100,000.

1.4 SYSTEM DESCRIPTION

- A. Section Includes
 - 1. Video Surveillance Remote Devices
- B. Performance Requirements
 - 1. The camera shall be Integrated Day Night active-infrared type.
 - 2. The camera shall incorporate IP Infrared Imaging (i3) design to optimize the combined benefits of IP and infrared illumination for critical imaging applications.
 - 3. The camera shall have IP network capability.
 - 4. The camera shall provide daytime color performance.
 - 5. The camera shall provide night-time active-infrared monochrome performance.
 - 6. The camera shall have a 2:1 interlaced scanning system.
 - 7. The camera shall be vandal resistant.
 - 8. The camera shall be designed to be gripless and anchor-free for maximum safety

9. The camera shall be energy efficient, drawing no more than 11W maximum.
10. The camera shall operate with high reliability.
11. The camera shall have been rigorously tested and proven for use by the manufacturer.
12. The camera shall be supported by a toll-free (U.S. and Canada) technical assistance program from the manufacturer, at no extra charge.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data:
 1. Manufacturer's data, user and installation manuals for all equipment and software programs including computer equipment and other equipment required for complete video management system.
- C. Shop Drawings; include
 1. System device locations on architectural floor plans.
 2. Full Schematic of system, including wiring information for all devices.
- D. Closeout Submittals
 1. User manual.
 2. Parts list.
 3. System device locations on architectural floor plans.
 4. Wiring and connection diagram.
 5. Maintenance requirements.

1.6 QUALITY ASSURANCE

- A. Manufacturer:
 1. Minimum of 10 years experience in manufacture and design Video Surveillance Devices.
 2. Manufacturer's quality system: Registered to ISO 9001 Quality Standard.
- B. Video Surveillance System:
 1. Listed by CSA.
 2. Certified compliant to FCC and CE for the required loads. Test methods are in accordance with Industry Canada and the IEC. Provide evidence of compliance upon request.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in manufacture's original, unopened, undamaged containers; and unharmed original identification labels.
- B. Protect store materials from environmental and temperature conditions following manufacturer's instructions.
- C. Handle and operate products and systems according to manufacturer's instructions.
- D. Bosch provides off-the-shelf availability for our top selling products and same-day or 24-hour shipping.

1.8 WARRANTY

- A. Provide manufacturer's warranty.

1.9 MAINTENANCE

- A. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.
- B. Provide factory direct technical support from 8:00 a.m. to 8:00 p.m. via phone and e-mail.

PART 2- PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer:
Bosch Security Systems, Inc.
130 Perinton Parkway
Fairport, New York, 1450, USA
Phone: + 1 800 289 0096
Fax: + 1 585 223 9180
security.sales@us.bosch.com
www.boschsecurity.us
- B. Substitutions: Under provisions of Section 01 60 00.
 - 1. All proposed substitutions must be approved by the Architect or Engineer professional.
 - 2. Proposed substitutions must provide a line-by-line compliance documentation.

2.2 BOSCH NEC-360F02-21W INFRARED IMAGER

- A. Performance:
 - 1. The camera shall be able to view the entire floor and all four walls of a 15 foot square room, including the two walls to which it is attached.
 - 2. The camera shall have no exposed wiring or anchor points, making it highly vandal-resistant and suitable for suicide watch.
 - 3. The camera shall have a 1/3" LXR CCD for excellent IR sensitivity, low smear, low streak and excellent anti-blooming characteristics
 - 4. The camera shall have automatic, photocell-controlled day-night switching.
 - 5. The camera shall have an 1/3" CCD with mechanical filter technology for vivid daytime color and effective night-time performance under infrared illumination.
 - 6. The camera shall incorporate automatic switching between day and night modes.
 - 7. The camera shall have daytime color mode.
 - 8. The camera shall have daytime color resolution of 540 horizontal lines.
 - 9. The camera shall have a minimum illumination for daytime color mode of 0.02Lux at F1.4.
 - 10. The camera shall have night-time IR monochrome mode.
 - 11. The camera shall have night-time monochrome resolution of 540 horizontal lines.
 - 12. The camera shall operate at zero lux in night-time monochrome mode.
 - 13. The camera design shall eliminate the possibility of focus shift to ensure accurate focus for a daytime average wavelength of 500nm and a night-time average wavelength of 850nm.
 - 14. The camera shall produce accurate color representation by eliminating IR bleed and/or other color distortions.
 - 15. The camera shall have spectral response to infrared wavelengths between 700nm to 1100nm.
 - 16. The camera shall produce outstanding contrast characteristics for reduced glare and streaking.
 - 17. The camera shall incorporate infrared illumination to reduce image noise at night,

enabling better compression, reducing bit rates and enhancing network stability.

18. The camera shall be equipped with an 84-LED infrared array allowing for clear pictures in zero lux conditions.
19. The LEDs shall be optimised to produce an evenly-distributed field of illumination at 850nm or 940nm.
20. The LEDs shall be intensity-adjustable through internally accessible controls.
21. The camera shall be outfitted with pan/tilt hardware for directional readjustments to the CCD and lens.
22. The camera shall be available with a 2.5mm wide-angle lens allowing a full 88° H-FoV and 72° V-FoV of the entire room.
23. The camera shall be available with various other lenses to achieve different fields of view.
24. The camera shall produce a signal to noise ratio of greater than 48dB (AGC off) under normal daylight conditions.
25. The camera shall provide a minimum 20 db S/N picture throughout an entire 15 foot square room in zero Lux
26. The camera shall support MPEG-4 SP and MJPEG compression, up to 30 frames per second, tristream selectable.
27. The camera shall support resolutions of 4CIF (25/30 IPS), 2CIF (25/30 IPS), half D1 (25/30IPS), CIF (25/30 IPS) and QCIF (25/30 IPS).
28. The camera shall have bandwidth configurable from 9.6 Kbps to 6 Mbps.
29. The camera shall support an Ethernet 10/100Base-T network interface with RJ45 network connector.
30. The camera shall have the following available protocols: Telnet, RTP, HTTP(S), ARP, TCP, UDP, IP, ICMP, DHCP, IGMPv2/v3, SNMP, 802.1x.
31. The camera shall have SSL-based authentication for enhanced security.

B. Electrical:

1. The camera shall accept 12 VDC or 24 VAC input.
2. The camera shall have separate camera and LED voltage regulator boards for increased electrical stability and reliability.
3. The camera shall accept not less than 12VDC to operate optimally.
4. The camera shall accept not greater than 24 VAC to operate optimally.
5. The camera shall consume no more than 11 watts maximum (900 mA @ 12 VDC)

C. Video Specifications

1. Sensor:
 - a. MX4 Hi-resolution Day/Night CCD:
 - 1) Effective Pixels:
 - a) NTSC: 768 x 494
 - 2) Resolution
 - a) Color: 540 TVL
 - b) Monochrome: 540 TVL
 - 3) S/N Ratio: Greater than 48 dB
 - 4) Daytime Sensitivity: 0.02 Lux with F1.4 lens
 - 5) Nigh-time Sensitivity: 0 Lux, operates in total darkness
 - 6) Lens Options: Fixed. 2.5 mm and 3.6 mm
 - 7) Gamma: 0.45
 - 8) Video Output: 1 Vpp, 75 Ohms
 - 9) Day-Night Switching: Photocell controlled, automatic
 - b. C7 Hi-resolution Color CCD:
 - 1) Effective Pixels:
 - a) NTSC: 768 x 494
 - b) PAL: 752 x 582
 - 2) Resolution: 500 TVL
 - 3) S/N Ratio: Greater than 48 dB

- 4) Daytime Sensitivity: 2.7 Lux with F1.4 lens
- 5) Night-time Sensitivity: 2.7 Lux with F1.4 lens
- 6) Lens Options: Fixed. 2.5 mm and 3.6 mm
- 7) Gamma: 0.45
- 8) Video Output: 1 Vpp, 75 Ohms

2. Infrared Illumination

- a. MX4 Hi-resolution Day/Night CCD:
 - 1) Photocell: Automatic, sensitivity adjustable
 - 2) LEDs: 84 LEDs, infrared, intensity adjustable
 - 3) Wavelength:
 - a) Covert: 940 nm
 - b) Semi-covert: 850 nm
 - 4) Night Vision Distance: 9 m (30 ft)
- b. C7 Hi-resolution Color CCD:
 - 1) LEDs: None, no IR window

D. Interfaces:

1. Ethernet: 10/100 Base-T RJ45

E. IP Specifications:

1. Protocols:
 - a. Telnet
 - b. RTP
 - c. HTTP(S)
 - d. ARP
 - e. TCP
 - f. UDP
 - g. IP
 - h. ICMP
 - i. DHCP
 - j. IGMPv2/v3
 - k. SNMP
 - l. 802.1x
2. Compression:
 - a. MPEG-4 SP
 - b. MJPEG
 - c. Up to 30 frames per second, tri-stream selectable
 - d. Frame Rate: 1-30 FPS programmable (full motion)
 - e. Bandwidth: Configurable from 9.6 Kbps to 6 Mbps

F. Resolution and Frame Rates

1. NTSC
 - a. 4CIF: 25/30 IPS: 704 x 480
 - b. SCIF: 25/30 IPS: 704 x 240
 - c. Half D1: 25/30 IPS: 352 x 480
 - d. CIF: 25/30 IPS: 352 x 240
 - e. QCIF: 25/30 IPS: 176 x 120

G. Mechanical:

1. The camera housing shall be a robust aluminum casting.
2. The camera shall have a white baked enamel finish.
3. The camera shall be equipped with a pan-tilt adjustable cable-managed wall bracket.
4. The window shall be 1/4 in. thick LEXAN.

5. Dimensions (H x W x D): 224 x 134 x 155 mm (8.8 x 5.3 x 6.1 in.)
6. Weight: 1.2 kg (2.6 lb)

H. Environmental:

1. The camera shall be ruggedized for vandal resistance.
2. The camera shall be in a "truncated tetrahedron" shape ensuring a flush installation into ceiling/wall corners.
3. The camera shall be designed to compensate for the walls and ceiling being out of "square" by as much as 3°.
4. The camera shall have no exposed wiring or anchor points, making it highly vandal-resistant and suitable for suicide watch.
5. The camera shall incorporate a 45° tilted face to enable viewing of entire rooms, including directly underneath the camera itself.
6. The camera shall have a flush-mounted front faceplate secured in place with six tamper-resistant screws.
7. The LED array shall be thermally managed with a continuous heat sink.
8. The camera shall have a die-cut gasket installed behind the faceplate to ensure watertightness from periodic splashes of liquids caused through attempted vandalism or cleaning.
9. The camera housing shall be equipped with two separate windows, one for IR light transmission and the other for CCD video imaging.
10. The camera shall have 1/4 in. (6 mm) Lexan windows and be fully supported with by continuously bolted-down metal back plate.
11. The camera shall allow convenient access to the lens, for any positional and focal adjustment.
12. The camera shall have pre-harnessed connectors allowing simple plug and play installation.
13. The camera housing shall be made of welded aluminum.
14. The camera shall be powder-coat painted in white.
15. The camera shall operate at a temperature range from -50°C to +50°C (-58°F to +122°F).

PART 3- EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive devices and notify adverse conditions affecting installation or subsequent operation.
- B. Do not begin installation until unacceptable conditions are corrected.

3.2 PREPARATION

- A. Protect devices from damage during construction.

3.3 INSTALLATION

- A. Install devices in accordance with manufacturer's instruction at locations indicated on the floor drawings plans.
- B. Perform installation with qualified service personnel.
- C. Install devices in accordance with the National Electrical Code or applicable local codes.

- D. Ensure selected location is secure and offers protection from accidental damage.
- E. Location must provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.

3.4 FIELD QUALITY CONTROL

- A. Test snugness of mounting screws of all installed equipment.
- B. Test proper operation of all video system devices.
- C. Determine and report all problems to the manufacturer's customer service department.

3.5 ADJUSTING

- A. Make proper adjustment to video system devices for correct operation in accordance with manufacturer's instructions.
- B. Make any adjustment of camera settings to comply with specific customer's need.

3.6 DEMONSTRATION

- A. Demonstrate at final inspection that video management system and devices functions properly.

END OF SECTION



SECTION 28 23 29
VIDEO SURVEILLANCE REMOTE DEVICES AND SENSORS
BOSCH AUTODOME COLOR MODULAR CAMERAS

PART 1- GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Video Surveillance Remote Devices
- B. Related Sections
 - 1. Section 28 23 13 – Video Surveillance Control and Management Systems.

1.2 REFERENCES

- A. American National Standards Institute (ANSI) (www.ansi.org).
 - 1. ANSI C63.4 Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
- B. Federal Communications Commission (FCC) (www.fcc.gov)
 - 1. FCC CFR 47 part 15 class A – Telecommunications – Radio Frequency Devices – Digital Device Emission.
- C. International Electrotechnical Commission (IEC)
 - 1. IEC 60529 Degrees of protection provided by enclosures (IP Code).
 - 2. IEC 60950 Information Technology Equipment – Safety.
- D. Institute of Electrical and Electronics Engineers, Inc. (IEEE) (www.ieee.org)
 - 1. IEEE 802.3af Power Over Ethernet.
- E. International Organization for Standardization (ISO)
 - 1. 9001 – Quality System.
- F. Underwriters Laboratories, Inc. (UL) (www.ul.com)
 - 1. UL 50 Enclosures for Electrical Equipment.
 - 2. UL 2043 Fire Test for Heat and Visible Smoke Release for Discrete Products and their Accessories Installed in Air-Handling Spaces.
 - 3. UL 60950-1 Information Technology Equipment - Safety.

1.3 DEFINITIONS

- A. IP Camera: conventional analog camera with an embedded encoder that directly generates IP Video stream.
- B. Encoders and Decoders: devices that transmit video, audio and camera control data to IP Cameras via IP Network such as Ethernet LAN, WAN or Internet.
- C. IP Video Management System: video surveillance system that enables users to view video via both a PC and analog monitors. Comprises a PC Based Host, Video Management Software, IP Cameras, IP Network switch and storage units.
- D. iSCSI: refers to protocol, a standardized way to talk to IP-based storage across an IP network

1.4 SYSTEM DESCRIPTION

- A. Video Surveillance Remote Devices
 - 1. Dome Color CCD camera
- B. Performance Requirements
 - 1. A color high resolution CCD dome camera system that allows to upgrading functionality, adapting to changing security needs, and migrating from analog to IP technology.
 - 2. Provide 24 hour security with detail images – day or night.
 - 3. Possesses advanced intelligence features.
 - 4. Have different mounting versions.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data:
 - 1. Manufacturer's data, user and installation manuals for all equipment and software programs including computer equipment and other equipment required for complete video management system.
- C. Shop Drawings; include
 - 1. System device locations on architectural floor plans.
 - 2. Full Schematic of system, including wiring information for all devices.
- D. Closeout Submittals
 - 1. User manual.
 - 2. Parts list.
 - 3. System device locations on architectural floor plans.
 - 4. Wiring and connection diagram.
 - 5. Maintenance requirements.

1.6 QUALITY ASSURANCE

- A. Manufacturer:
 - 1. Minimum of 10 years experience in manufacture and design Video Surveillance Devices.
 - 2. Manufacturer's quality system: Registered to ISO 9001 Quality Standard.
- B. Video Surveillance System
 - 1. Listed by UL specifically for the required loads. Provide evidence of compliance upon request.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in manufacture's original, unopened, undamaged containers; and unharmed original identification labels.
- B. Protect store materials from environmental and temperature conditions following manufacturer's instructions.
- C. Handle and operate products and systems according to manufacturer's instructions.
- D. Bosch provides off-the-shelf availability for our top selling products and same-day or 24-hour shipping.

1.8 WARRANTY

- A. Provide manufacturer's warranty.

1.9 MAINTENANCE

- A. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.
- B. Provide factory direct technical support from 8:00 a.m. to 8:00 p.m. via phone and e-mail.

PART 2- PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer:
Bosch Security Systems, Inc.
130 Perinton Parkway
Fairport, New York, 1450, USA
Phone: + 1 800 289 0096
Fax: + 1 585 223 9180
security.sales@us.bosch.com
www.boschsecurity.us
- B. Substitutions: Under provisions of Section 01 60 00.
1. All proposed substitutions must be approved by the Engineer professional.
 2. Proposed substitutions must provide a line-by-line compliance documentation.

2.2 BOSCH AUTODOME COLOR MODULAR CAMERA SYSTEM SERIES 300

- A. General Characteristics:
1. A modular camera system based on five types of interchangeable modules: CPU, camera, housing, communications and power supply.
 - a. CPU Module determines fixed or PTZ (pan/tilt/zoom) capability and advance intelligence functions like: privacy masking, motion detection and tracking.
 - b. Camera Module includes fixed or PTZ, color or Day/Night and zoom range options.
 - c. Housing Module is available for indoor and outdoor applications.
 - d. Communications Module determines how video and data will be communicated to the matrix switch, DVR or IP video system.
 - e. Power supply module options meet site specific installation requirements (indoor or outdoor) and protection against unexpected surges in power.
 2. Allow hotswap capability (change modules without having to power down the system).
 3. Camera dome bubble:
 - a. Meets flame, crush, and impact resistant requirements able to exceed UL 746C standard for polymeric material enclosures.
 - b. Is a high-resolution bubble made of acrylic.
 - c. Should have a clear version.
 4. Camera housing designed in-ceiling, or indoor/outdoor pendant versions.
 5. Camera dome designed in wall mount, roof (parapet) mount, mast (pole) mount, corner mount, pipe mount, and in-ceiling versions. The pendant camera system is a Type 4X (NEMA 4X) and IP66 certified, rugged, weather-resistant package.
- B. AutoDome Color Modular Camera System Series 300 features:
1. Provide a fast address method to allow the camera address number used for control to be remotely programmed from the system keyboard.

2. Ensure that any advanced commands required to program the dome are accessed via three levels of password protection ranging from low to high.
3. Provide a feature that automatically rotates, or pivots, the camera to simplify tracking of a person walking directly under the camera.
4. Provide advanced troubleshooting and diagnostics via diagnostic LEDs and on-screen diagnostic displays.
5. Possess on-screen display menus that support English, French, German, Spanish, Portuguese, Polish, Italian, Russian, Czech, and Dutch.
6. Allow an optional hybrid analogue/IP communication module that simultaneously stream IP video across a local or wide area network, and analogue video via coaxial cabling to support existing analog equipment.
7. Allow an optional integral fiber optic transceiver module, capable of transmitting and receiving video and Biphase signals up to 2.5 miles (4 km). The fiber optic module is compatible with 50/125 mm, 62.5/125 mm, low-loss multimode glass fiber, rated for minimum system bandwidth of 20 MHz (video 850 nm/data 1300 nm).
8. Allow an optional integral fiber optic Ethernet media converter kit module capable of transmitting 10/100 Mbps Ethernet signals over fiber optic cable using Small Form-factor Pluggable (SFP) modules up to 37 miles (60 km). The fiber optic module is compatible with 50/125 mm, 62.5/125 mm, low-loss multimode glass fiber and : 8–10/125 μm singlemode fiber.
9. Compatible with Bosch Allegiant series switcher/controller, Divar and DiBos digital video recorders, and Bosch IP network video solutions like the VIDOS video management system, and Bosch Video Management System (BVMS).

C. CPU MODULES

1. 300 Series CPU Module VG4-MCPU-300
 - a. Provide fast 360° per second camera pan/tilt speeds; advanced troubleshooting and diagnostics via diagnostic LEDs and on-screen displays; and built in surge protection. The camera's 360° rotation can be divided into 16 independent sectors with 16-character titles per sector. Any or all of the 16 sectors can be blanked from the operator's view.
 - b. Provide 24 masks with up to 8 masks per scene that prohibit areas of the field of view from being seen even if the camera is panned, tilted, or zoomed. The masks can be shaped using three (3), four (4) or five (5) anchor points to form different shapes to best fit the area to be masked. Mask selections can be black, white or blurred.
 - c. Have preset tour function. Allow the recording of two (2) separate tours of an operator's keyboard movements consisting of tilt and zoom activities, for a total combined duration time of 15 minutes. The recorded tours can be continuously played back.
 - d. Store up to 99 preset scenes with each preset programmable for 16 character titles. Two (2) separate preset tours can be available to display consecutively the preset scenes for a programmed dwell time. Any or all of the presets can be included or excluded from the tour.
 - e. Provide advanced alarm handling to manage up to seven (7) alarm inputs and four (4) alarm outputs by means of a programmable "Rules" engine. Any or all of the input contacts can be programmed upon activation to automatically move the camera to any preposition location, close an output relay for a programmed period of time, and display an alarm indication on the on-screen display of the monitor.
 - f. When an operator stops manual control of the camera, and a programmed period of time is allowed to expire, the camera can execute one of the following programmable options: return to a preset number, return to the automated tour previously executed, and do nothing.
 - g. Provide an AutoPivot feature to automatically rotate and flip the camera as it tilts through the vertical position to maintain the correct orientation of the image.

- h. Provide an AutoScaling feature that reduce the pan/tilt speed as the camera zooms in on an object, so that the relative speed on the screen remains constant.
- i. Interchangeable with any AutoDome Modular Camera System.

D. PTZ CAMERA MODULES

1. Bosch 36X Day/Night, 12X Digital, PTZ Camera Module
 - a. Consist of an integrated high resolution Exview HAD CCD camera using a 1/4-inch imager and a 36X (3.4 – 122.4 mm, F1.6 to F4.5) auto-iris, auto-focus optical zoom lens with manual override. It will have a variable high speed, 360° pan/tilt drive with a top speed of 120° per second.
 - b. Designed to perform over a wide range of environmental and lighting conditions with a horizontal resolution of 540 TVL (NTSC/PAL) typical and sensitivity down to 0.03 lux in color mode, and 0.006 lux in night mode.
 - c. Switch automatically from daylight color operation to a higher sensitivity nighttime monochrome mode when light levels fall below an adjustable threshold level. Day/night operation may also be manually switched on or off from the system switcher/controller keyboard.
 - d. Possess a full 12X digital zoom that is functional once the maximum 36X optical zoom limit has been reached. The 12X digital zoom lens is on/off selectable from the system controller keyboard.
 - e. Have a Freeze Frame feature that holds a preposition shot while moving to another preposition.
 - f. Designed to be hot swappable with any AutoDome Modular Camera System.
 - g. Requirements:
 - 1) Resolution Horizontal: 540 TVL (NTSC, PAL).
 - 2) Sensitivity:
 - a) Color Mode (30 IRE): F1.6, 1/60 (1/50) shutter, max AGC
SensUp Off: 0.6 lux
SensUp On: 0.003 lux
 - b) Night Mode (30 IRE): F1.6, 1/60 (1/50) shutter, max AGC
SensUp Off: 0.16 lux
SensUp On: 0.006 lux
 - 3) Electronic Shutter Speed (AES): 1 to 1/10,000.
 - 4) Lens: 3.4 mm to 122.4 mm, (F1.6 to F4.5).
 - 5) Optical Zoom: 36X.
 - 6) Digital Zoom: 12X.
 - 7) Video Output: 1.0Vp-p +/- 0.1Vp-p, 75 ohms.
 - 8) Synchronization: Line-lock (-120° to 120° vertical phase adjust) or internal crystal.
 - 9) Signal to Noise Ratio: Greater than 50 dB.
 - 10) White Balance: 2,000 K to 10,000 K.
 - 11) Pan/Tilt Speed: 0.1°/s to 120°/s.

E. COMMUNICATIONS MODULE

1. Bosch Ethernet (TCP/IP) communications module VG4-MTRN-E1
 - a. A hybrid IP Communication Module capable of capturing and storing images using H.264 and JPEG encoding and compression, and supplying analogue video over coaxial cable.
 - b. Deliver DVD-quality 4CIF video, at rates up to 30 images per second, via TCP/IP over Cat5/Cat6 UTP cable. The IP module leverages bandwidth throttling and multicasting capabilities to manage bandwidth and storage requirements efficiently while delivering the best possible image quality and resolution.
 - c. Simultaneously stream two H.264 stream and one JPEG stream.
 - d. Generate two independent H.264 streams and a JPEG stream simultaneously. Allow streaming high-quality images for live viewing while recording at a reduced frame rate and, at the same time, stream JPEG images to a remote PDA device.

- e. Support integrated one-way audio to allow a user to monitor audio at the camera site over the network. The video and audio is relayed as a single media stream, so the two are synchronized.
- f. Support iSCSI devices to allow a network-enabled AutoDome to stream video directly to an iSCSI RAID array. Allow local video storage without streaming high bandwidth video across the network. System-recording performance is completely independent from network performance.
- g. Supply simultaneously analogue video over coaxial cable to support existing analogue equipment.
- h. Support the following NTCIP standards:
 - 1) CCTV Camera Control: NTCIP 1205
 - 2) Application Layer: SNMP per NTCIP 1101:1996 & NTCIP 2301
 - 3) Transport/Network Layers: TCP/IP per NTCIP 2202:2001
 - 4) Sub-network Layer: PMPP (Point to Multi-Point Protocol) per NTCIP 2101:2001 & NTCIP 2102:2003

F. HOUSING MODULES

- 1. Designed in Outdoor Pendant, Indoor Pendant, In-Ceiling, and Pressurized Environmental versions.
- 2. Housings come standard with recessed setscrews and a recessed bubble latch for increased tamper resistance.
- 3. Provide built-in surge protection for power, data, and video and alarm inputs.
- 4. Pressurized Environmental Housing, clear bubble VG4-MHSG-NC
 - a. Provide a maximum internal pressure of 11 psi (75.84 kPa) \pm 5% of dry nitrogen to eliminate the effects of moisture, dust, insects, and corrosive exhaust fumes.
 - b. Use a hinge, in-place of a tether, to make installation easier and safer.
 - c. Allow camera to view 18° above the horizon.
 - d. Made of cast aluminum for corrosion resistance, and supplied with a built-in heater/blower to provide an operating temperature range down to -40 degrees C to 50 degrees C (-40 degrees F to 122 degrees F). An optional "XT" temperature kit is available to extend the operational range down to -60°C (-76° F).
 - e. Type 4X (NEMA 4X) and IP67 certified.

G. POWER SUPPLY MODULES

- 1. Certifications from UL, CE, NEMA-rated.
- 2. Operating Temperature: -60° to 50°C (-76° to 122° F).
- 3. Humidity: 0% to 100%, condensing.
- 4. Color: white.
- 5. Bosch VG4-A-PSU1
 - a. Input: 120 VAC, 50/60 Hz
 - b. Output Rating: 24 V@96 VA
 - c. Input Fuses: 1.6 A
 - d. Output Fuses: Camera – 2.0 A
 - e. Output Fuses: Heater – 3.15 A

H. Electrical:

- 1. Main supply input voltage:
 - a. NTSC: 115VAC, 60Hz.
- 2. Camera input voltage/power requirements: 21 – 30 VAC, 50/60 Hz.
- 3. Heater input voltage/power requirements: 21 – 30 VAC, 50/60 Hz.
- 4. Power Draw (Typical):
 - a. Pressurized Environmental Housing Models
 - 1) Ethernet Model:
 - a) Outdoor: 55 W
 - b) Outdoor XT: 71 W
- 5. Surge Suppression (Protection)

- a. Video: Peak current 10kA (Gas Tube Arrester), peak power 1000 W (10/1000 μ s).
- b. Power Input (Dome): Peak current 7.3 A, peak power 600 W (10/1000 μ s).
- c. Power Output (Arm Power Supply): Peak current 21.4 A, peak power 1500 W (10/1000 μ s).
- d. 300 series Alarm Inputs: Peak current 17 A, peak power 300 W (8/20 μ s).
- e. 300 series Alarm Outputs: Peak current 2 A, peak power 300 W (8/20 μ s).
- f. 300 series Relay Outputs: Peak current 7.3 A, peak power 600 W (10/1000 μ s).

I. Mechanical:

- 1. Pressurized Environmental model
 - a. Weight: 2.23 kg (4.92 lb)
 - b. Pan Range: 360° continuous.
 - c. Tilt Angle: 18° above horizon.
 - d. Power: 21 – 30 VAC, 50/60 Hz.
 - e. 300 series Variable Speed: 0.1°/s to 120°/s.
 - f. 300 series Pre-position Speed: Pan: 360°/s Tilt: 100°/s.
 - g. 300 series Preset Accuracy: +/-0.1°.

J. Environmental:

- 1. Pressurized Environmental model
 - a. Operating Temperature: -40° to 50°C (-40° to 122°F).
 - b. Storage Temperature: -40° to 60°C (-40° to 140°F).
 - c. Humidity: 0% to 100% relative condensing.
 - d. Enclosure ratings:
 - 1) Type 4X (NEMA 4X)
 - 2) IP67

2.3 ACCESSORIES

A. Heating Module

- 1. EnviroDome Bosch VG4-SHTR-XT
 - a. Extended temperature heater module extends temperature range to - 60°C (-76° F).

B. Mounts

- 1. Pipe mount, white Bosch VG4-A-9543.
- 2. Pendant arm mount 24 VAC, white Bosch VG4-A-PA0.
- 3. Pendant arm mount 24 VAC and Fiber Optic module, white Bosch VG4-A-PA0F.
- 4. Pendant arm mount with 120 VAC transformer, white Bosch VG4-A-PA1.
- 5. Pendant arm mount with 120 VAC transformer and Fiber Optic module, white Bosch VG4-A-PA1F.
- 6. Pendant arm mount with 230 VAC transformer, white Bosch VG4-A-PA2.
- 7. Pendant arm mount with 230 VAC transformer and Fiber Optic Module, white Bosch VG4-A-PA2F.
- 8. Optional Mounting Accessories
 - a. For Arm Mounts
 - 1) Corner Mounting Plate – Bosch LTC 9542/01
 - 2) Mast (Pole) Mounting Plate – Bosch LTC 9541/01
 - a) Designed for poles with a diameter between 100–300 mm (4-15 in.)
 - b. Standard Pole – Bosch LTC 9316/00P
 - 1) Square, heavy-duty steel
 - 2) 16-ft mounting pole
 - 3) Supports up to 91 kg (200 lbs)

PART 3-- EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive devices and notify adverse conditions affecting installation or subsequent operation.
- B. Do not begin installation until unacceptable conditions are corrected.

3.2 PREPARATION

- A. Protect devices from damage during construction.

3.3 INSTALLATION

- A. Install devices in accordance with manufacturer's instruction at locations indicated on the floor drawings plans.
- B. Perform installation with qualified service personnel.
- C. Install devices in accordance with the National Electrical Code or applicable local codes.
- D. Ensure selected location is secure and offers protection from accidental damage.
- E. Location must provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.

3.4 FIELD QUALITY CONTROL

- A. Test snugness of mounting screws of all installed equipment.
- B. Test proper operation of all video system devices.
- C. Determine and report all problems to the manufacturer's customer service department.

3.5 ADJUSTING

- A. Make proper adjustment to video system devices for correct operation in accordance with manufacturer's instructions.
- B. Make any adjustment of camera settings to comply with specific customer's need.

3.6 DEMOSTRATION

- A. Demonstrate at final inspection that video management system and devices functions properly.

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

January 12, 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: SOUTHWEST JUVENILE HALL SECURITY CAMERA PROJECT

To Whom It May Concern:

Attached is a copy for publication in your newspaper for **TWO (2) CONSECUTIVE TUESDAYS: JANUARY 17, 2012 and JANUARY 24, 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: Thursday, January 12, 2012 9:49 AM
To: Gil, Cecilia
Subject: RE: FOR PUBLICATION: Bids for SW Juv. Hall Sec. Camera

Received for publication on Jan. 17 and 24

PLEASE NOTE: The Press-Enterprise offices will be closed on Monday, January 16th in Observance of Martin Luther King Jr. Day. Our holiday deadlines are as follows:

Martin Luther King Jr. Deadlines	
Publication Date	Date to be submitted to the PE
Sat 1/14	Thurs 1/12 @10:30am
Sun 1/15	Thurs 1/12 @10:30am
Mon 1/16	Thurs 1/12 @10:30am
Tues 1/17	Thurs 1/12 @10:30am
Wed 1/18	Fri 1/13 @10:30am

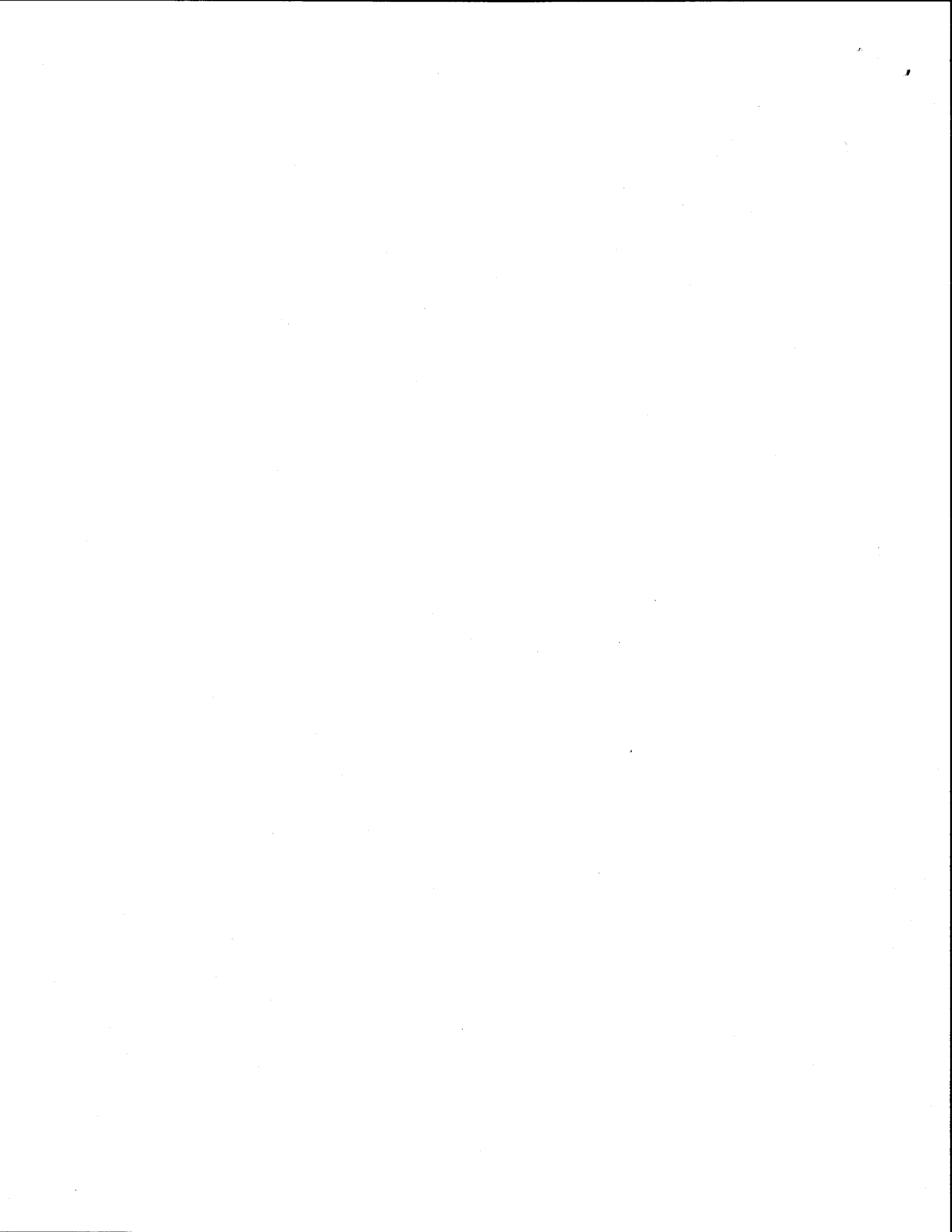
From: Gil, Cecilia [<mailto:CCGIL@rcbos.org>]
Sent: Thursday, January 12, 2012 8:58 AM
To: PE Legals
Subject: FOR PUBLICATION: Bids for SW Juv. Hall Sec. Camera

Hello! Notice Inviting Bids is attached for publication on 2 Tuesdays: Jan. 17 and 24, 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.**





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

January 12, 2012

THE CALIFORNIAN
ATTN: LEGALS
28765 SINGLE OAK DR., STE. 100
TEMECULA, CA 92590

FAX (951) 699-1467
E-MAIL: legals@californian.com

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To Whom It May Concern:

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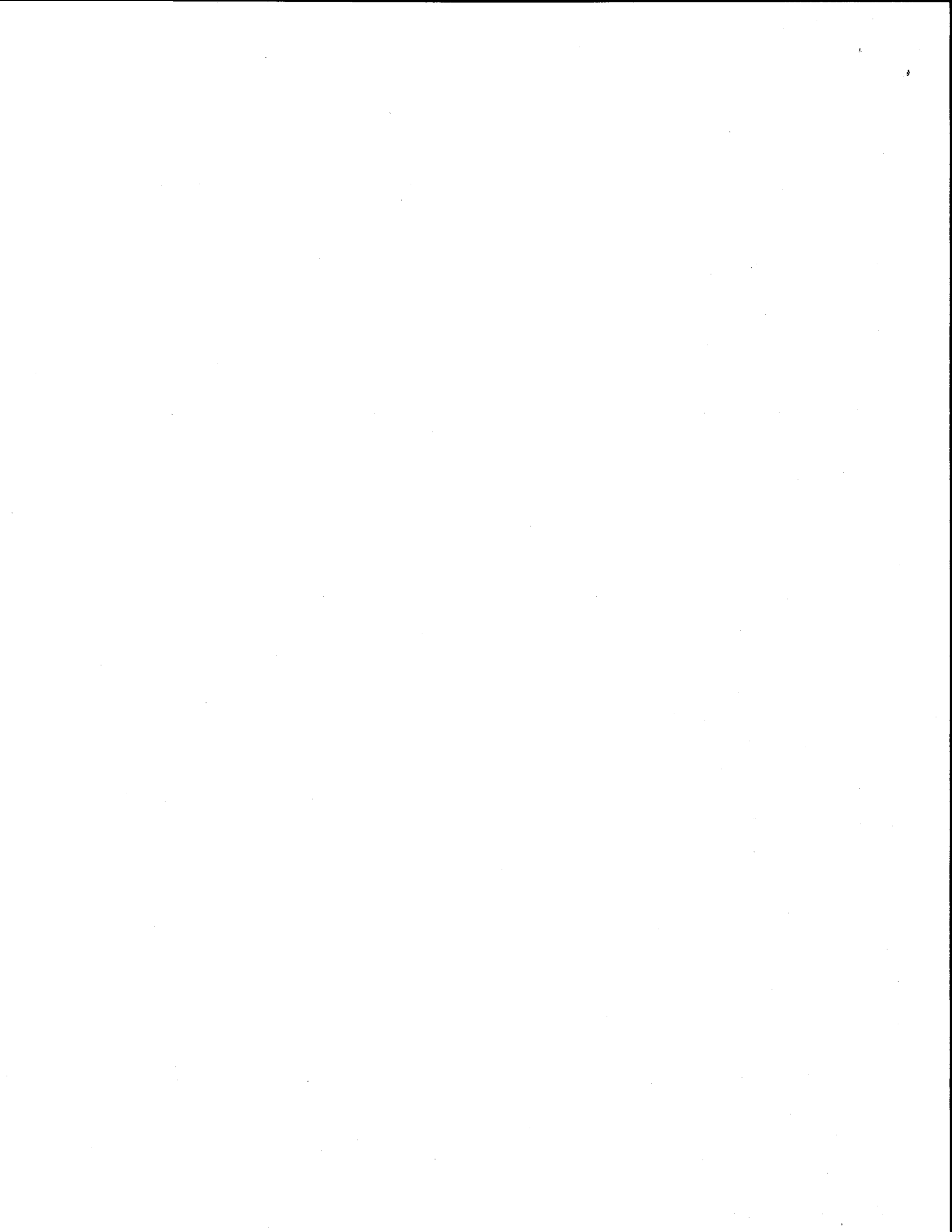
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Thank you in advance for your assistance and expertise.

Sincerely,

Mcgil

Cecilia Gil, Board Assistant to
KECIA HARPER-IHEM, CLERK OF THE BOARD



Gil, Cecilia

From: Tammi Swenson <TSwenson@californian.com>
Sent: Thursday, January 12, 2012 9:26 AM
To: Gil, Cecilia
Subject: RE: FOR PUBLICATION: Bids for SW Juv. Hall Sec. Camera

Received... will send proof copy shortly =)

Tammi Swenson
Legal Advertising Representative
The Californian & The North County Times
951-676-4315 ext 2604



From: Gil, Cecilia [<mailto:CCGIL@rcbos.org>]
Posted At: Thursday, January 12, 2012 8:58 AM
Posted To: Legals - Californian
Conversation: FOR PUBLICATION: Bids for SW Juv. Hall Sec. Camera
Subject: FOR PUBLICATION: Bids for SW Juv. Hall Sec. Camera

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THANK YOU!

Cecilia Gil

Board Assistant to the
Clerk of the Board of Supervisors
951-955-8464

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PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING.**



NOTICE INVITING BIDS

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

Southwest Juvenile Detention Center Security Camera System Upgrade Project

This Project is to remove and replace existing outdated security camera system and to install new CCTV System and server room.

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 **10:00 am on Thursday, February 16, 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 one hundred seventy-five dollars (\$175.00) 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:

ARC

4295 Main Street, Riverside CA 92501

Phone: 951-686-0530

Email: riverside.digiprint@e-arc.com

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 **Tuesday, January 31 at 9:30 AM**, at County of Riverside Southwest Juvenile Probation Center, **30755D Auld Road, Murrieta, California**. **No bids will be accepted from bidders who have not attended the pre-bid job walk.**

For further information, contact Tim Warner, Project Manager, at the Economic Development Agency, located at 3403 10th Street, Riverside, CA 92501, whose telephone number is (951) 955-4896.

Dated: January 12, 2012

Kecia Harper-Ihem, Clerk of the Board
By: Cecilia Gil, Board Assistant

