

CITY OF ROHNERT PARK
CONTRACT DOCUMENTS, SPECIAL PROVISIONS AND
STANDARD SPECIFICATIONS

FOR

HONEYBEE POOL RENOVATION PROJECT

PROJECT NO. 2019-31

BID DUE DATE: MARCH 30, 2023

NON MANDATORY PRE-BID MEETING DATE: MARCH 22, 2023



Prepared by
City of Rohnert Park-
Public Works
600 Enterprise Drive
Rohnert Park, CA 94928
(707) 588-3300

CITY COUNCIL

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Vice-Mayor – Susan Hollingsworth
Council Member – Jackie Elward
Council Member – Gerard Giudice
Council Member – Emily Sanborn
City Manager – Marcela Piedra
City Engineer – Vanessa Garrett

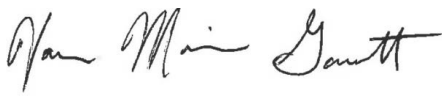
Approved:  3/10/2023
Vanessa Garrett Date
City Engineer

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PART 1 - BID DOCUMENTS

INVITATION FOR SEALED BIDS

**HONEYBEE POOL RENOVATION PROJECT
PROJECT NO. 2019-31**

Notice is hereby given that on **Thursday, March 30, 2023, at 2:00 PM** at 130 Avram Avenue, Rohnert Park, California, the City of Rohnert Park will receive and open sealed bids for the HONEYBEE POOL RENOVATION PROJECT, Project No. 2019-31. Sealed bids shall be dropped off in the secured box to the right of the main doors in front of City Hall before 2:00 pm on Thursday, March 30, 2023. The work is described generally as renovating the City of Rohnert Park's Honeybee Pool, including ADA upgrades to the restroom and concession buildings, refinishing the pool, and demolition of the decommissioned kiddie pool. The Contractor must have a valid California contractor's license, a Class B license. The Engineer's estimate for this project is \$1,800,000. The Contractor must begin work within fifteen (15) calendar days after official notice by the City Engineer to proceed with the work and must diligently prosecute the same to completion within 180 calendar days of that Notice.

Under California Labor Code section 1770 *et seq.*, copies of the determination of the Director of the Department of Industrial Relations of the general prevailing rate of per diem wages for each craft, classification and type of workman needed to execute the work are on file in and available to any interested person on request at the Department of Public Works, or on the Internet at <http://www.dir.ca.gov/dlsr/PWD/index.htm>, and are incorporated herein. (Labor Code § 1773.2.) Prevailing wage determinations must also be posted at each job site.

SB 854 (Stat. 2014, Chapter 28) establishes that no contractor or subcontractor may be listed on a bid proposal for a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)]. No contractor or subcontractor may be awarded a contract for public work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5. This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. All contractors and subcontractors must furnish electronic certified payroll records directly to the Labor Commissioner (aka Division of Labor Standards Enforcement). The prime contractor must also post job site notices prescribed by regulation.

Per California Civil Code Section 9550, a payment bond in the amount of 100% of the bid total will be required from the successful bidder for bids exceeding \$25,000. The bond must be provided within fifteen (15) calendar days from notice of award and prior to the performance of any work.

A performance bond and bid bond must also be provided for bids exceeding \$25,000.

For any moneys earned by the Contractor and withheld by the City of Rohnert Park to ensure the performance of the contract, the Contractor may, at its request and sole expense, substitute certain securities equivalent to the amount withheld in the form and manner and subject to the terms and conditions provided in the California Public Contracts Code Section 22300.

This notice incorporates by reference the terms, conditions and requirements of the specifications approved by the City, any and all changes or amendments to the specifications and special instructions or special notice issued to or given to prospective bidders.

The City of Rohnert Park makes no representation or warranty of the condition of the jobsite. All prospective bidders are requested to carefully review the plans and specifications and to examine and conduct tests or otherwise satisfy themselves as to the conditions at the project site, subject to coordination with the office of the Rohnert Park City Engineer.

Except as otherwise indicated in the Instructions to Bidders, bids will be publicly opened, examined and declared on said day and hour and referred to and considered by the City Council at a future City Council meeting. Each bid must be submitted on the bid forms furnished by the City, and each bid must include all the items shown on these forms. Substitute forms may be used if specified in this Notice.

A non-mandatory prebid conference will be held at Honeybee Pool located at 1170 Golf Course Drive, Rohnert Park at 10:00 AM on Wednesday, March 22, 2023. Additional site visits can be scheduled if the City is notified 24 hours in advance.

The City reserves the right, in its sole discretion, to reject any or all bids, to re-bid, or to waive inconsequential defects in bidding not involving time, price or quality of the work. The City may reject any and all bids and waive any minor irregularity in the bids.

A copy of the drawings and specifications may be obtained from the City of Rohnert Park, Laura Luchini, Project Coordinator, 600 Enterprise Drive, Rohnert Park, California 94928, telephone: (707) 588-3308, email PWProjects@rpcity.org, upon payment of a \$30 nonrefundable fee, if picked up, or payment of a \$45 nonrefundable fee, if mailed.

Posted Date: March 8, 2023

/s/ SYLVIA LOPEZ CUEVAS

Published Dates: March 10, 2023
March 17, 2023

City Clerk of the City of Rohnert Park

INSTRUCTIONS TO BIDDERS

The bidder must file its bid with the City Engineer of the City of Rohnert Park, California, using the copy of the Bidder's Proposal and Schedule of Bid Prices furnished with the specifications. These documents must be placed in a sealed envelope marked,

HONEYBEE POOL RENOVATION PROJECT PROJECT NO. 2019-31

and addressed to the City Engineer of the City of Rohnert Park, California. Said sealed bids shall be dropped off in the secured box to the right of the main doors in front of City Hall located at 130 Avram Avenue, Rohnert Park, California before Thursday at 2:00 PM on March 30, 2023. The bidder must not file the book of Special Provisions or the Contract Drawings with his bid.

The bidders attention is directed to the schedule of bid prices that requires this project be bid as a unit price contract.

Bid Forms. Each proposal and all bid submittals must conform and be responsive to the Invitation, the Plans, Specifications and Contract documents.

The wording of the proposal and bid submittals must not be changed. Any additions, conditions, limitations, or provisions inserted by the bidder will render the proposal irregular and may cause its rejection. Erasures or interlineations in the proposal or other submittals must be explained or noted over the signature of the bidder.

In case of discrepancy between a unit price and the total price set forth for the unit price item, the unit price shall prevail. Discrepancies between the indicated sum of any column of numerals and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between written words and figures, or words and numerals, will be resolved in favor of the words.

Prices. All proposals must give the prices proposed, both in writing and in figures in the respective spaces provided, and must be signed by the bidder, who must fill out all blanks in the proposal form as therein required.

Rejection of Bids. Proposals may be rejected if they show any alterations of form, additions not called for, conditional proposals, incomplete proposals, erasures, or irregularities of any kind, excepting that erasures or delineations in the proposal will be accepted as provided under "Bid Forms" above.

When proposals are signed by an agent, other than the officer or officers of a corporation authorized to sign Contracts on its behalf or a member of a co-partnership, a Power of Attorney must be on file with the City prior to opening proposals or must be submitted with the proposal; otherwise, the proposal may be rejected as irregular and unauthorized.

Bid Security. All proposals must be presented under sealed cover and accompanied by one of the following forms of bidder's security: Cashier's check, certified check, or a bidder's bond in form provided herein, executed by an admitted surety insurer authorized to transact business in this State, made payable to the City. Said bidder's bond submitted must be the City's bid bond. The security must be in an amount equal to at least 10 percent of the proposal amount. A proposal must not be considered unless one of the forms of bidder's security is enclosed with it. A bidder's bond will not be accepted unless it has been properly filled out and executed by the surety and by the bidder.

Withdrawal of Bid. Any bid may be withdrawn at any time prior to the time fixed in the public notice for the opening of proposals only by written request for the withdrawal of bid filed with the City Engineer. The request must be executed by the bidder or its duly authorized representative. The withdrawal of a bid does not prejudice the right of the bidder to file a new bid. This article does not authorize the withdrawal of any bid after the time fixed in the public notice for the opening of bids.

Means of Submittal. Proposals submitted by facsimile and proposals failing to reach the office of the City prior to the date and time set for receipt of same will not be considered.

Opening. Bids will be opened and read at the time and place indicated in the Invitation for Sealed Bids. Bidders and the public are invited to be present.

Multiple Proposals. More than one proposal from an individual, a firm or partnership, a corporation or an association under the same or different names, will not be considered. Reasonable grounds for believing that any bidder is interested in more than one proposal for the work contemplated will cause the rejection of all proposals in which such bidder is interested. If there is reason for believing that collusion exists among the bidders, none of the participants in such collusion will be considered in future proposals. Proposals in which the prices obviously are unbalanced may be rejected.

License Requirement. No proposal will be accepted from a Contractor who is not licensed in accordance with law under the provisions of Division III, Chapter 9, of the Business and Professions Code of the State of California, or from a Contractor that has been deemed irresponsible or unresponsive by the City Council.

Subcontractors. Subcontractors listed by the bidder in accordance with the Special Provisions included herein must be properly licensed under the laws of the State of California for the type of work which they are to perform.

All bidders are hereby notified that they will be required to comply strictly with the provisions of Sections 4100 to 4113, inclusive, of the Public Contract Code of the State of California.

Each bidder must file with its proposal the name and location of place of business, contractor's license number and Department of Industrial Relations registration number, of each Subcontractor who will perform a portion of the Contract work in an amount in excess of one-half of one percent, or in the case of bids for the construction of streets or highways, including bridges, in excess of one-half of one percent (0.5%) of the total bid or \$10,000. In each such instance, the nature and extent of the work to be sublet must be described.

The General Contractor to whom the Contract is awarded will not be permitted, without the written consent of the City, to substitute any person as Subcontractor in place of the Subcontractor designated in the original proposal, or to permit any Subcontract to be assigned or transferred, or to allow it to be performed by anyone other than the original Subcontractor. The City may consent to the substitution of another person as Subcontractor if the original Subcontractor, after having reasonable opportunity so to do, fails or refuses to execute the written Contract presented to it by the General Contractor, when said written Contract is based upon the conditions of the general Contract and complies with the Subcontractor's written proposal.

The failure of the Contractor to specify a Subcontractor for any portion of the Contract work in excess of one-half of one percent of the total Contract price, must be deemed to indicate that the Contractor intends to perform such portion itself. The subletting or Subcontracting of work for which no Subcontractor was designated in the original proposal and which is in excess of one-half of one percent of the total Contract price will be allowed only with the written consent of the City and then only in cases of public emergency or necessity as determined by said City. Under such circumstances, the City is required to establish the facts constituting the emergency or necessity and reduce its findings to a written public record.

Violations of the provisions of these specified sections of the Code must be deemed to be a violation of the Contract, and the City, because of any such violations, must have the right to cancel the Contract. The

Contractor, after any such violations, must be penalized to the extent of 20 percent of the amount of the Subcontract involved.

Material. The bidder may be required to furnish, as part of the submittal process, a complete statement of the origin, composition, and manufacture of any or all materials to be used in the construction of the work, together with samples. Such samples may be subjected to the tests provided for in these specifications or in the Special Provisions to determine their quality and fitness for the work.

Additional Requirements. The bidder's attention is directed to Section 3 of the General Provisions for additional proposal requirements and conditions, and information regarding award and execution of the contract. Contractor submitting a bid to the City of Rohnert Park, a public entity, must state, under penalty of perjury, the contractor's license number and the license's expiration date. This information must be entered in the Schedule of Bid Prices. No contractor or subcontractor may be awarded a contract for public work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

Explanations and Addenda. Any explanation desired by the bidders regarding the meaning or interpretation of the drawings and specifications must be requested in writing and in sufficient time to allow for a written reply to reach them and all other potential bidders before the date and time for submission of bids. Oral explanation or instructions given before award of the contract will not be binding. Any interpretations made will be in the form of an addendum to the specifications or drawings and will be furnished to all bidders and its receipt by the bidder must be acknowledged. Any explanation that makes a material change, addition, or deletion to the terms of the Invitation for Sealed Bids shall be issued no less than 72 hours before the date and time for submission of bids. If an explanation making a material change, addition, or deletion must be issued less than 72 hours before the scheduled date and time for submission of bids, the date and time for submission shall be extended so that a full 72 hours is provided for analysis of the change, addition, or deletion.

Quantity of Work. The quantity of work for the unit price items to be done under the contract as noted in the Bid Schedule is but an estimate and is not to be taken as an expressed or implied statement that the actual quantity of work will correspond to the estimate. The right is reserved to increase or decrease, or to entirely eliminate items from the work if found desirable or expedient. The Contractor will be allowed no claims for anticipated profits, loss of profits, or for any damages of any sort because of any difference between the estimated and the actual quantities of work done.

The quantities given in the schedule, for unit price items, are for comparing proposals and may vary from the actual final quantities. Some quantities may be increased and others may be decreased or entirely eliminated, and no claim must be made against the City for damage occasioned thereby or for loss of anticipated profits, the Contractor being entitled only to compensation for the actual work done at the unit prices proposal.

The City reserves and must have the right to increase or decrease the quantities of work to be performed under a scheduled unit item or to entirely omit the performance thereof and upon decision of the City to so do, the City Engineer will direct the Contractor to proceed with the said work as so modified. If an increase in the quantity of work so ordered should result in delay to the work, the Contractor will be given an equivalent extension of time.

All estimates and all measurements used in determining the quantities of unit price items of work done, the percentage of completion of lump sum items of work, and the quantity of materials furnished under the Contract at various times during the progress of the work must be the Engineer's estimates and measurements.

The planimeter must be considered an instrument of precision adapted to the measurements of all areas.

Insurance. The bidder's attention is drawn to Special Provisions, Location and Description of Work, and Special Provisions, Minimum Limits of Insurance.

Inspection of Site. The bidder must examine carefully the site of the work contemplated and the proposal, plans, specifications, and the Contract form therefor. It will be assumed that the bidder has investigated and is satisfied as to the conditions to be encountered, as to the character, quality, and quantities of work to be performed and materials to be furnished, and as to the requirements of these specifications, the special provisions, and the Contract.

Where investigation of subsurface conditions has been made by the City in respect to foundation or other design, bidders may inspect the records of the City as to such investigation, including examination of samples, if available. When the Plans include a log of test borings showing a record of the data obtained by the City's investigation of subsurface conditions, said log represents only the opinion of the City as to the character of material encountered by it in its test borings and is only included for the convenience of bidders.

Investigations of subsurface conditions are made for the purpose of design. The City assumes no responsibility whatever in respect to the sufficiency or accuracy of borings or of the log of test borings or other preliminary investigations, or of the interpretation thereof, and there is no guaranty, either expressed or implied, that the conditions indicated are representative of those existing throughout the work, or any part of it, or that unlooked for developments may not occur.

Making such information available to the bidders is not to be construed in any way as a waiver of the provisions of the first paragraph of this article and bidders must satisfy themselves through their own investigations as to conditions to be encountered.

No information derived from such inspection of the records of preliminary investigations made by the City or from the maps, plans, specifications, profiles or drawings will in any way relieve the Contractor from any risk from properly fulfilling all the terms of the Contract.

Records of such preliminary investigations as may have been made by the City may be inspected at the office of the Engineer.

Pre-construction Meeting. At the pre-construction meeting, the successful bidder must submit a CPM progress schedule which will show the time he/she proposes to occupy in prosecuting the various major divisions of work and his/her proposed sequence of operations. The CPM progress schedule must be subject to the approval of the City Engineer.

Adjustment of Schedule. If at any time the construction schedule is inadequate to secure completion of the work within the time specified, and the work is being prosecuted inadequately or improperly, the Engineer must have the right to require the Contractor to submit a revised progress schedule, providing for proper and timely completion of the work.

The Contractor must not be entitled to additional compensation on account of revisions required by the City.

BIDDER'S PROPOSAL

**HONEYBEE POOL RENOVATION PROJECT
PROJECT NO. 2019-31**

To: City Council, City of Rohnert Park

The undersigned hereby declares:

- (a) That the only persons or parties interested in this proposal as principals are the following:

(If the bidder is a corporation, give the name of the corporation and the name of its president, secretary, treasurer, and manager. If a co-partnership, give the name under which the co-partnership does business, and the names and addresses of all co-partners. If an individual, state the name under which the contract is to be drawn.)

- (b) That this proposal is made without collusion with any other person, firm, or corporation.
- (c) That he/she has carefully examined the locations of the proposed work, and has familiarized himself/herself with all of the physical and climatic conditions, and makes this bid solely upon his/her own knowledge.
- (d) That he/she has carefully examined the drawings and specifications and makes this proposal in accordance therewith.
- (e) That, if this bid is accepted, he/she agrees to enter into an agreement with City in the form included in the Contract Documents to complete all work as specified in the Contract for the contract price and within the contract time indicated in this bid and in accordance with the Contract Documents.
- (f) That this bid will remain open and not be withdrawn for the period specified in the Instructions to Bidders.
- (g) That he/she has read the insurance requirements in Section 2.03, Insurance in the Special Provisions section of this bid document;
- (h) That he/she has conferred with his/her insurance carriers or brokers to determine in advance of the bid submission the availability of insurance certificates and endorsements as prescribed and provided herein;
- (i) That if the bid is accepted, he/she will enter into a written contract and within fifteen (15) calendar days furnish the required proof of insurance including certificates and endorsements;
- (j) That failure to comply strictly with the insurance requirements may result in forfeiture of the bid security and withdrawal of the bid proposal.
- (k) That he/she is properly licensed in accordance with California Business and Professions Code section 7000 et seq. Bidder acknowledges that if the bidder is not properly licensed at the time the bid is awarded or as otherwise required by law, the bid will be considered non-responsive and will be rejected.
- (l) That he/she and any subcontractor relied on by him will keep an accurate payroll record, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice,

worker, or other employee employed by the contractor or subcontractor in connection with the public work, as more fully set forth in the Contract. All contractors and subcontractors must furnish electronic certified payroll records directly to the Labor Commissioner (aka Division of Labor Standards Enforcement).

- (m) That in compliance with the Subletting and Subcontracting Fair Practices Act, California Public Contracts Code section 4100 et seq., he/she has listed on the attached "List of Subcontractors" each subcontractor who will perform work or labor or render service to the bidder in or about the construction of the work or will specifically fabricate and install a portion of the work in an amount in excess of one half of one percent (0.5%) of the total bid sum or in the case of bids or offers for the construction of streets or highways, including bridges, in excess of one-half of one percent (0.5%) of the total bid or \$10,000, whichever is greater, and that no subcontractors may be used other than those specified without written approval of the City Engineer.

Accompanying this proposal is a certified or cashier's check, or bidder's bond payable to the order of the City Clerk of the City of Rohnert Park, in the sum of _____ Dollars (\$ _____). Said bidder's bond submitted is the City's bid bond form. Said bidder's bond has been duly executed by the undersigned bidder and by a financially sound surety company admitted in the State of California.

It is understood and agreed that should the bidder fail within fifteen (15) calendar days after the date of mailing written notice to the successful bidder that the contract has been awarded, to enter into the contract and furnish acceptable surety bonds and insurance on forms included herein, then the proceeds of said check, or bidder's bond, must become the property of the City. But if the contract is entered into and said bonds are furnished or if the bid is not accepted, then said check must be returned to the undersigned or the bidder will be released from the bidder's bond.

Address of Bidder

Telephone Number of Bidder

City, State, Zip

Signature of Bidder

SCHEDULE OF BID PRICES

**HONEYBEE POOL RENOVATION PROJECT
PROJECT. NO. 2019-31**

In accordance with the plans and specifications therefor approved by the City of Rohnert Park, the undersigned bidder is herewith submitting the following bid prices for the performance of the entire proposed work as described in these specifications and attached drawings.

ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL COST
1	Mobilization/Demobilization		LS		
2	Pool		LS		
3	Deck/ Sidewalk		LS		
4	Fencing/ Gate		LS		
5	Wading Pool		LS		
6	Restroom Building Exterior		LS		
7	Restroom Building Interior		LS		
8	Concession Building Exterior		LS		
9	Concession Building Interior		LS		
10	Project ID Sign		LS		

Total Amount of Bid (written in words) is: _____
_____ Dollars

and _____ Cents.

Any discrepancy between words and figures shall be resolved as provided in the Instructions to Bidders.

\$ _____
(Figures)

Address of Bidder

Signature of Bidder

City, State, Zip

Name of Bidder (Print)

Telephone Number of Bidder

FAX Number of Bidder

Contractor's License Number

License's Expiration Date

Contractor's DIR Number

Contractor's email address

ADDENDUM ACKNOWLEDGEMENT

ADDENDUM #1 Date _____ Signature acknowledging receipt: _____

ADDENDUM #2 Date _____ Signature acknowledging receipt: _____

ADDENDUM #3 Date _____ Signature acknowledging receipt: _____

CONTRACTOR'S LICENSE DECLARATION
(Business and Professions Code Section 7028.15)

The undersigned declares that he or she is _____ of _____ (party making foregoing bid) (hereinafter the "Bidder")

1. Bidder's Contractor's License Number is as follows: _____.
2. The expiration date of Bidder's Contractor's License is _____, 20__.
3. Bidder acknowledges that pursuant to Section 7028.15(a) of the Business and Professions Code it is a misdemeanor for any person to submit a bid to a public agency in order to engage in the business or act in the capacity of a contractor within this state without having a license therefor, except as provided therein.

The undersigned declares, under penalty of perjury, that the representations made by the undersigned in this bid proposal are true and correct.

Executed on _____, 20 __, at _____ (insert city and state where Declaration signed).

Signature

Typed Name

Title

Name of Bidder

LIST OF SUBCONTRACTORS

In accordance with the provisions of Sections 4102 to 4108, inclusive, of the Public Contract Code of the State of California, each bidder must list below the name and location of place of business, contractors license number and Department of Industrial Relations registration number of each subcontractor who will perform a portion of the contract work in an amount in excess of one-half of one percent of the total contract price. In each such instance, the nature and extent of the work to be sublet must be described.

Subcontractor name, and California Contractor's License Number and DIR Registration Number	Location of Place of Business	Description of Work to be Performed (also show bid Schedule Item No.)	Percentage of total contract work to be performed
Name:			
CLN:			
DIR:			
Name:			
CLN:			
DIR:			
Name:			
CLN:			
DIR:			
Name:			
CLN:			
DIR:			
Name:			
CLN:			
DIR:			
Name:			
CLN:			
DIR:			
Name:			
CLN:			
DIR:			
Name:			
CLN:			
DIR:			

[Add additional sheets if necessary]

****Note, the Subletting and Subcontracting Fair Practices Act also requires inclusion of any subcontractor who specially fabricates and installs a portion of the work according to detailed drawings.**

BID BOND

Bond No. _____

WHEREAS, _____ ("Principal") intends to submit a bid to the City of Rohnert Park ("City") for the above-referenced Project, and the terms of the bid require the Principal to submit bidder's security.

NOW, THEREFORE, Principal and _____, a corporation organized and existing under the laws of the State of _____ and duly authorized to transact business under the laws of the State of California, as Surety, are held and firmly bond unto City in the sum of _____ dollars (\$ _____) lawful money of the United States of America, such sum being not less than ten percent (10%) of the bid amount for the payment of which sum to be made, the Principal and Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT, if the Principal submits a bid for the above-referenced Project, the terms and conditions of which are incorporated herein by reference, and if said bid is rejected by the City, or if said bid is accepted by the City and the Bidder properly executes and submits to the City the Agreement and all required documents (including the Performance bond, the Payment Bond, and the proof of insurance), then this obligation must be null and void; otherwise it must be and remain in full force and effect.

The Surety hereby agrees, for value received, that its obligations under this bond must in no way be impaired or modified by an agreement between the City and the Principal to extend the time within which the City may accept the Principal's bid, and the surety hereby waives notice of any such extension.

In the event suit is brought upon this bond, the surety must pay reasonable attorneys' fees and costs incurred by the prevailing parties in such suit, which fees and costs must be in addition to the face amount of the bond.

IN WITNESS WHEREOF, the undersigned represent and warrant that they have the right, power, legal capacity, and authority to enter into and execute this document on behalf of the Principal and the Surety, and have caused this document to be executed by setting hereto their names, titles and signatures.

Principal: _____
(Name of Firm)

Surety: _____
(Name of Firm)

By: _____

By: _____

Title: _____

Title: _____

Date: _____

Date: _____

Address for Notices to Surety:

Note: Notary acknowledgment for Surety and Surety's Power of Attorney must be attached.

NONCOLLUSION DECLARATION

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

The undersigned declares:

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

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

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

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

Firm (print or type)

Signature

DECLARATION OF ELIGIBILITY TO CONTRACT

The undersigned, a duly authorized representative of the bidder, certifies and declares that:

1. The bidder is aware of California Labor Code sections 1771.1 and 1777.7, which prohibit a contractor or subcontractor who has been found by the Labor Commissioner or the Director of Industrial Relations to be in violation of certain provisions of the Labor Code from bidding on, being awarded, or performing work as a subcontractor on a public works project for specified periods of time.
2. The bidder is not prohibited from bidding on, being awarded, or performing work as a contractor or subcontractor on a public works project under Labor Code sections 1771.1 and 1777.7, or any other provision of law.
3. The bidder is aware of California Public Contract Code section 6109, which states:
 - "(a) A public entity, as defined in Section 1100 [of the Public Contract Code], may not permit a contractor or subcontractor who is ineligible to bid or work on, or be awarded, a public works project pursuant to Section 1771.1 or 1777.7 of the Labor Code to bid on, be awarded, or perform work as a subcontractor on, a public works project. Every public works project shall contain a provision prohibiting a contractor from performing work on a public works project with a subcontractor who is ineligible to perform work on the public works project pursuant to Section 1777.1 or 1777.7 of the Labor Code.
 - (b) Any contract on a public works project entered into between a contractor and a debarred subcontractor is void as a matter of law. A debarred subcontractor may not receive any public money for performing work as a subcontractor on a public works contract, and any public money that may have been paid to a debarred subcontractor by a contractor on the project will be returned to the awarding body. The contractor is responsible for the payment of wages to workers of a debarred subcontractor who has been allowed to work on the project."
4. The bidder has investigated the eligibility of each and every subcontractor that bidder intends to use on this public works project, and determined that none of them is ineligible to perform work as a subcontractor on a public works project by virtue of Public Contract Code section 6109, Labor Code sections 1771.1 and 1777.7, or any other provision of law.

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

Executed this _____ day of _____, 20____, at _____, California.

Signature and Title of Authorized Official

CONTRACT

HONEYBEE POOL RENOVATION PROJECT PROJECT NO. 2019-31

THIS AGREEMENT, made and entered into this _____ day of _____, 2023, by and between _____, hereinafter called "Contractor", and the City of Rohnert Park, hereinafter called "City".

WHEREAS, the City Council of said City has awarded a contract to Contractor for performing the work hereinafter mentioned in accordance with the sealed proposal of said Contractor.

NOW, THEREFORE, IT IS AGREED, as follows:

1. Scope of Work: The Contractor must perform all the work and furnish all the labor, materials, equipment and all utility and transportation services required to complete all of the work of construction and installation of the improvements more particularly described in the Resolution adopted by the City Council of said City on <<MONTH DAY, YEAR>>, the items and quantities of which are more particularly set forth in the Contractor's bid therefor on file in the office of the City Clerk, except work to be performed by subcontractors as set forth in the Contractor's bid and for which the Contractor retains responsibility.

2. Time of Performance and Liquidated Damages: The Contractor must begin work within fifteen (15) calendar days after official notice by the City Engineer to proceed with the work and must diligently prosecute the same to completion within one hundred eighty (180) calendar days of that Notice. The Contractor acknowledges and agrees that time is of the essence with respect to Contractor's work and that Contractor shall diligently pursue performance of the work.

In the event the Contractor does not complete the work within the time limit so specified or within such further time as said City Council must have authorized, the Contractor must pay to the City liquidated damages in the amount of four thousand, two hundred dollars (\$4,200) per day for each and every day's delay in finishing the work beyond the completion date so specified. Additional provisions with regard to said time of completion and liquidated damages are set forth in the specifications, which provisions are hereby referred to and incorporated herein by reference.

3. Payments: Payments will be made by City to the Contractor for said work performed at the times and in the manner provided in the specifications and at the unit prices stated in Contractor's bid.

The award of the contract is for a total amount of <<AMOUNT>>.

4. Component Parts and Interpretation: This contract must consist of the following documents, each of which is on file in the office of the City Clerk and all of which are incorporated herein and made a part hereof by reference thereto:

- a) This Agreement
- b) Notice Inviting Sealed Proposals
- c) Instruction and Information to Bidders
- d) Accepted Proposal, with all attachments and certifications
- e) Performance Bond
- f) Payment Bond
- g) Special Provisions
- h) Standard Specifications

- i) Technical specifications
- j) Design Standards
- k) Plans, Profiles and Detailed Drawings

In the event of conflict between these documents, the following order of precedence will govern: this contract; change orders; supplemental agreements and approved revisions to plans and specifications; special conditions; standard specifications; detail plans; general plans; standard plans; reference specifications. In the absence of a controlling or contrary provision in the foregoing, the *Standard Specifications* (2022 edition) of the California Department of Transportation shall apply to this project.

5. Independent Contractor. Contractor is and will at all times remain as to City a wholly independent contractor. Neither City nor any of its officers, employees, or agents will have control over the conduct of Contractor or any of Contractor's officers, employees, agents or subcontractors, except as expressly set forth in the Contract Documents. Contractor may not at any time or in any manner represent that it or any of its officers, employees, agents, or subcontractors are in any manner officers, employees, agents or subcontractors of City.

6. Prevailing Wages: Copies of the determination of the Director of the Department of Industrial Relations of the prevailing rate of per diem wages for each craft, classification or type of worker needed to execute this Contract will be on file in, and available at, the office of the Director at 601 Carmen Drive, Camarillo, California 93010.

Contractor must post at the work site, or if there is no regular work site then at its principal office, for the duration of the Contract, a copy of the determination by the Director of the Department of Industrial Relations of the specified prevailing rate of per diem wages. (Labor Code § 1773.2.)

Contractor, and any subcontractor engaged by Contractor, may pay not less than the specified prevailing rate of per diem wages to all workers employed in the execution of the contract. (Labor Code § 1774.) Contractor is responsible for compliance with Labor Code section 1776 relative to the retention and inspection of payroll records.

Contractor must comply with all provisions of Labor Code section 1775. Under Section 1775, Contractor may forfeit as a penalty to City up to \$200.00 for each worker employed in the execution of the Contract by Contractor or any subcontractor for each calendar day, or portion thereof, in which the worker is paid less than the prevailing rates. Contractor may also be liable to pay the difference between the prevailing wage rates and the amount paid to each worker for each calendar day, or portion thereof, for which each worker was paid less than the prevailing wage rate.

Nothing in this Contract prevents Contractor or any subcontractor from employing properly registered apprentices in the execution of the Contract. Contractor is responsible for compliance with Labor Code section 1777.5 for all apprenticeable occupations. This statute requires that contractors and subcontractors must submit contract award information to the applicable joint apprenticeship committee, must employ apprentices in apprenticeable occupations in a ratio of not less than one hour of apprentice's work for every five hours of labor performed by a journeyman (unless an exception is granted under § 1777.5), must contribute to the fund or funds in each craft or trade or a like amount to the California Apprenticeship Council, and that contractors and subcontractors must not discriminate among otherwise qualified employees as apprentices solely on the ground of sex, race, religion, creed, national origin, ancestry or color. Only apprentices defined in Labor Code section 3077, who are in training under apprenticeship standards and who have written apprentice contracts, may be employed on public works in apprenticeable occupations.

With each application for payment, Contractor shall also deliver certified payrolls to Owner as set forth above in these General Conditions, and concurrently therewith (but in no event less frequently than monthly) directly to the Labor Commissioner in the format prescribed by the Labor Commissioner.

If federal funds are used to pay for the Work, Contractor and any subcontractor agree to comply, as applicable, with the labor and reporting requirements of the Davis-Bacon Act (40 USC § 276a-7), the Copeland Act (40 USC § 276c and 18 USC § 874), and the Contract Work Hours and Safety Standards Act (40 USC § 327 and following).

7. Hours of Labor: Contractor acknowledges that under California Labor Code sections 1810 and following, eight hours of labor constitutes a legal day's work. Contractor will forfeit as a penalty to City the sum of \$25.00 for each worker employed in the execution of this Contract by Contractor or any subcontractor for each calendar day during which such worker is required or permitted to work more than eight hours in any one calendar day and 40 hours in any one calendar week in violation of the provisions of Labor Code section 1810.

8. Apprentices: Attention is directed to the provisions in Sections 1777.5 (Chapter 1411, Statutes of 1968) and 1777.6 of the 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 the public works 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. The ratio of apprentices to journeymen in such cases must not be less than one to five except:

- A. When unemployment in the area of coverage by the joint apprenticeship committee has exceeded an average of 15 percent in the 90 days prior to the request for certificate, or
- B. When the number of apprentices in training in that area exceeds a ratio of one to five, or
- C. When the trade can show that it is replacing at least 1/30 of its membership through apprenticeship training on an annual basis statewide or locally, or
- D. When the assignment of an apprentice to any work performed under a public works Contract would create a condition which would jeopardize his life or the life, safety, or property of fellow employees or the public at large, or if the specified task to which the apprentice is to be assigned is of such a nature that training cannot be provided by a journeyman, or
- E. When the Contractor provides evidence that he employs registered apprentices on all of his Contracts on an annual average of not less than one apprentice to eight journeymen.

The Contractor is required to make contributions to funds established for the administration of apprenticeship program 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 such contributions.

The Contractor and any Subcontractor under him must comply with the requirements of Section 1777.5 and 1777.6 in the employment of apprentices.

Information relative to apprenticeship standards, wage schedules, and other requirements may be obtained from the Director of Industrial Relations, ex officio the Administrator of Apprenticeship, San Francisco, California, or from the Division of Apprenticeship Standards and its branch offices. .

9. Labor Discrimination: Attention is directed to Section 1735 of the Labor Code, which reads as follows:

"A contractor must not discriminate in the employment of persons upon public

works on any basis listed in subdivision (a) of Section 12940 of the Government Code, as those bases are defined in Sections 12926 and 12926.1 of the Government Code, except as otherwise provided in Section 12940 of the Government Code. Every contractor for public works who violates this section is subject to all the penalties imposed for a violation of this chapter. "

10. Workmen's Compensation Insurance: In accordance with the provisions of Article 5, Chapter 1, Part 7, Division 2 (commencing with Section 1860) and Chapter 4, Part 1, Division 4 (commencing with Section 3700) of the Labor Code of the State of California, the Contractor is required to secure the payment of compensation to his employees and must for that purpose obtain and keep in effect adequate Workmen's Compensation Insurance.

The undersigned Contractor is aware of the provisions of Section 3700 of the Labor Code which requires every employer to be insured against liability for workmen's compensation or to undertake self-insurance in accordance with the provisions of that Code, and will comply with such provisions before commencing the performance of the work of this contract.

11. Indemnity and Insurance: To the fullest extent permitted by law (including without limitation California Civil Code Section 2782), Contractor must indemnify, hold harmless, release and defend City, its officers, elected officials, employees, agents, volunteers, and consultants from and against any and all actions, claims, demands, damages, disability, losses, expenses including, but not limited to, attorney's fees and other defense costs and liabilities of any nature that may be asserted by any person or entity including Contractor, in whole or in part, arising out of Contractor's activities hereunder, including the activities of other persons employed or utilized by Contractor including subcontractors hired by the Contractor in the performance of this Agreement excepting liabilities due to the sole negligence, intentional misconduct or active negligence of the City. This indemnification obligation is not limited in any way by any limitation on the amount or type of damages or compensation payable by or for Contractor under Worker's Compensation, disability or other employee benefit acts or the terms, applicability or limitations of any insurance held or provided by Contractor and must continue to bind the parties after termination/completion of this Agreement.

Contractor shall procure and maintain throughout the time for performance of the work under this Contract the insurance required by the Special Provisions. The requirement that Contractor procure and maintain insurance shall in no way be construed to limit the Contractor's duty to indemnify City as provided in the paragraph above.

Failure of City to monitor compliance with these requirements imposes no additional obligations on City and will in no way act as a waiver of any rights hereunder.

12. City Right of Termination and Right to Complete the Work. The City may terminate the Contract when conditions encountered during the work make it impossible or impracticable to proceed, or when the City is prevented from proceeding with the Contract by act of God, by law, or by official action of a public authority. In addition, the occurrence of any of the following is a default by Contractor under this Contract:

- A. Contractor refuses or fails to prosecute the Work or any part thereof with such diligence as will insure its completion within the time specified or any permitted extension.
- B. Contractor fails to complete the Work on time.
- C. Contractor is adjudged bankrupt, or makes a general assignment for the benefit of creditors, or a receiver is appointed on account of Contractor's insolvency.
- D. Contractor fails to supply enough properly skilled workers or proper materials to complete the Work in the time specified.
- E. Contractor fails to make prompt payment to any subcontractor or for material or

labor.

- F. Contractor fails to abide by any applicable laws, ordinances or instructions of City in performing the Work.
- G. Contractor breaches or fails to perform any obligation or duty under the Contract.

Upon the occurrence of a default by Contractor, the Director will serve a written notice of default on Contractor specifying the nature of the default and the steps needed to correct the default. Unless Contractor cures the default within 10 days after the service of such notice, or satisfactory arrangements acceptable to City for the correction or elimination of such default are made, as determined by City, City may thereafter terminate this Contract by serving written notice on Contractor. In such case, Contractor will not be entitled to receive any further payment, except for Work actually completed prior to such termination in accordance with the provisions of the Contract Documents.

In event of any such termination, City will also immediately serve written notice of the termination upon Contractor's surety. The surety will have the right to take over and perform pursuant to this Contract; provided, however, that if the surety does not give City written notice of its intention to take over and perform this Contract within five days after service of the notice of termination or does not commence performance within 10 days from the date of such notice, City may take over the 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 Contractor. Contractor and the surety will be liable to City for any and all excess costs or other damages incurred by City in completing the Work.

If City takes over the Work as provided in this Section, City may, without liability for so doing, take possession of, and utilize in completing the Work, such materials, appliances, plant, and other property belonging to Contractor as may be on the site of the Work and necessary for the completion of the Work.

13. Substitution of Securities for Withheld Amounts: Pursuant to California Public Contracts Code Section 22300, securities may be substituted for any moneys withheld by a public agency to ensure performance under a contract. At the request and sole expense of the Contractor, securities equivalent to the amount withheld must be deposited with the public agency, or with a state or federally chartered bank as the escrow agent, who must pay such moneys to the Contractor upon satisfactory completion of the contract.

Securities eligible for substitution under this section must include those listed in the California Public Contracts Code Section 22300 or bank or savings and loan certificates of deposit. The Contractor must be the beneficial owner of any securities substituted for moneys withheld and must receive any interest thereon.

Alternatively, the Contractor may request and the City shall make payment of retentions earned directly to the escrow agent at the expense of the Contractor. At the expense of the Contractor, the Contractor may direct the investment of the payments into securities and the Contractor shall receive the interest earned on the investments upon the same terms provided for in Section 22300 for securities deposited by the Contractor. Upon satisfactory completion of the Contract, the Contractor shall receive from the escrow agent all securities, interest, and payments received by the escrow agent from the City, pursuant to the terms of this section.

Any escrow agreement entered into pursuant to this section must contain as a minimum the following provisions:

- a. The amount of securities to be deposited;
- b. The terms and conditions of conversion to cash in case of the default of the Contractor; and
- c. The termination of the escrow upon completion of the contract.

14. General Provisions

A. Authority to Execute. Each Party represents and warrants that all necessary action has been taken by such Party to authorize the undersigned to execute this Contract and to bind it to the performance of its obligations.

B. Assignment. Contractor may not assign this Contract without the prior written consent of City, which consent may be withheld in City's sole discretion since the experience and qualifications of Contractor were material considerations for this Contract.

C. Binding Effect. This Agreement is binding upon the heirs, executors, administrators, successors and permitted assigns of the Parties.

D. Integrated Contract. This Contract, including the Contract Documents, is the entire, complete, final and exclusive expression of the Parties with respect to the Work to be performed under this Contract and supersedes all other agreements or understandings, whether oral or written, between Contractor and City prior to the execution of this Contract.

E. Modification of Contract. No amendment to or modification of this Contract will be valid unless made in writing and approved by Contractor and by the City Council, City Manager or Assistant City Manager, as applicable. The Parties agree that this requirement for written modifications cannot be waived and that any attempted waiver will be void.

F. Counterparts, Facsimile or other Electronic Signatures. This Contract may be executed in several counterparts, each of which will be deemed an original, and all of which, when taken together, constitute one and the same instrument. Amendments to this Contract will be considered executed when the signature of a party is delivered by facsimile or other electronic transmission. Such facsimile or other electronic signature will have the same effect as an original signature.

G. Waiver. Waiver by any Party of any term, condition, or covenant of this Contract will not constitute a waiver of any other term, condition, or covenant. Waiver by any Party of any breach of the provisions of this Contract will not constitute a waiver of any other provision, or a waiver of any subsequent breach or violation of any provision of this Contract. Acceptance by City of any Work performed by Contractor will not constitute a waiver of any of the provisions of this Contract.

H. Interpretation. This Contract will be interpreted, construed and governed according to the laws of the State of California. Each party has had the opportunity to review this Contract with legal counsel. The Contract will be construed simply, as a whole, and in accordance with its fair meaning. It will not be interpreted strictly for or against either party.

I. Severability. If any term, condition or covenant of this Contract is declared or determined by any court of competent jurisdiction to be invalid, void or unenforceable, the remaining provisions of this Contract will not be affected and the Contract will be read and construed without the invalid, void or unenforceable provision.

J. Venue. In the event of litigation between the parties, venue in state trial courts will be in the County of Sonoma. In the event of litigation in a U.S. District Court, venue will be in the Northern District of California.

IN WITNESS WHEREOF, the City of Rohnert Park has caused these presents to be executed by its officers, thereunto duly authorized, and Contractor has subscribed same, all on the day and year first above written.

CITY OF ROHNERT PARK

<<CONTRACTOR>>

Marcela Piedra, City Manager Date
Per Resolution No _____ adopted by the Rohnert Park
City Council at its meeting of _____.

Name: _____ Date
Title: _____

ATTEST:

APPROVED AS TO FORM:

City Clerk

City Attorney

INSURANCE

Bidder's attention is directed to the following insurance forms and to Section 2.03 of the Special Provisions, located on Pages 2-1 through 2-6 in the Special Provisions section. It is highly recommended that bidders confer with their respective insurance carriers or brokers to determine in advance of bid submission the availability of insurance certificates and endorsements as prescribed and provided herein. Failure to comply strictly with the insurance requirements may result in forfeiture of the bid security and withdrawal of the bid proposal.

CERTIFICATE OF INSURANCE

CITY OF ROHNERT PARK (the "City")

ISSUE DATE MM/DD/YY)

PRODUCER	THIS CERTIFICATE OF INSURANCE IS NOT AN INSURANCE POLICY AND DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.																		
INSURED	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;"></th> <th style="text-align: center; width: 20%;">COMPANIES</th> <th style="text-align: center; width: 20%;">BEST'S RATING</th> </tr> </thead> <tbody> <tr> <td>COMPANY LETTER A _____</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>COMPANY LETTER B _____</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>COMPANY LETTER C _____</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>COMPANY LETTER D _____</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>COMPANY LETTER E _____</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> </tbody> </table>		COMPANIES	BEST'S RATING	COMPANY LETTER A _____	_____	_____	COMPANY LETTER B _____	_____	_____	COMPANY LETTER C _____	_____	_____	COMPANY LETTER D _____	_____	_____	COMPANY LETTER E _____	_____	_____
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COMPANY LETTER E _____	_____	_____																	

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

CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	ALL LIMITS IN THOUSANDS												
	GENERAL LIABILITY <input type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS MADE <input type="checkbox"/> OCCUR. <input type="checkbox"/> OWNER'S & CONTRACTOR'S PROT. <input type="checkbox"/> OTHER _____				<table style="width: 100%; border-collapse: collapse;"> <tr><td>GENERAL AGGREGATE</td><td style="text-align: right;">\$</td></tr> <tr><td>PRODUCTS-COMP/OPS AGGREGATE</td><td style="text-align: right;">\$</td></tr> <tr><td>PERSONAL & ADVERTISING INJURY</td><td style="text-align: right;">\$</td></tr> <tr><td>EACH OCCURRENCE</td><td style="text-align: right;">\$</td></tr> <tr><td>FIRE DAMAGE (Any one fire)</td><td style="text-align: right;">\$</td></tr> <tr><td>MEDICAL EXPENSE (Any one person)</td><td style="text-align: right;">\$</td></tr> </table>	GENERAL AGGREGATE	\$	PRODUCTS-COMP/OPS AGGREGATE	\$	PERSONAL & ADVERTISING INJURY	\$	EACH OCCURRENCE	\$	FIRE DAMAGE (Any one fire)	\$	MEDICAL EXPENSE (Any one person)	\$
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	AUTOMOBILE LIABILITY <input type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS <input type="checkbox"/> NON-OWNED AUTOS <input type="checkbox"/> GARAGE LIABILITY				<table style="width: 100%; border-collapse: collapse;"> <tr><td>COMBINED SINGLE LIMIT</td><td style="text-align: right;">\$</td></tr> <tr><td>BODILY INJURY (Per person)</td><td style="text-align: right;">\$</td></tr> <tr><td>BODILY INJURY (Per accident)</td><td style="text-align: right;">\$</td></tr> <tr><td>PROPERTY DAMAGE</td><td style="text-align: right;">\$</td></tr> </table>	COMBINED SINGLE LIMIT	\$	BODILY INJURY (Per person)	\$	BODILY INJURY (Per accident)	\$	PROPERTY DAMAGE	\$				
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	<input type="checkbox"/> WORKER'S COMPENSATION AND EMPLOYERS' LIABILITY				<table style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: center;">STATUTORY</td><td></td></tr> <tr><td>EACH ACCIDENT</td><td style="text-align: right;">\$</td></tr> <tr><td>DISEASE-POLICY LIMIT</td><td style="text-align: right;">\$</td></tr> <tr><td>DISEASE-EACH EMPLOYEE</td><td style="text-align: right;">\$</td></tr> </table>	STATUTORY		EACH ACCIDENT	\$	DISEASE-POLICY LIMIT	\$	DISEASE-EACH EMPLOYEE	\$				
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	PROPERTY INSURANCE <input type="checkbox"/> COURSE OF CONSTRUCTION				<table style="width: 100%; border-collapse: collapse;"> <tr><td>AMOUNT OF INSURANCE</td><td style="text-align: right;">\$</td></tr> </table>	AMOUNT OF INSURANCE	\$										
AMOUNT OF INSURANCE	\$																

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/RESTRICTIONS/SPECIAL ITEMS

- THE FOLLOWING PROVISIONS APPLY:**
1. None of the above-described policies will be canceled until after 30 days' written notice has been given to the City at the address indicated below.
 2. The City of Rohnert Park, its officers, elected officials, employees, agents and volunteers are added as insureds on all liability insurance policies listed above.
 3. It is agreed that any insurance or self-insurance maintained by the City will apply in excess of and not contribute with, the insurance described above.
 4. The City is named a loss payee on the property insurance policies described above, if any.
 5. All rights of subrogation under the property insurance policy listed above have been waived against the City.
 6. The workers' compensation insurer named above, if any, agrees to waive all rights to subrogation against the City for injuries to employees of the insured resulting from work for the City or use of the City's premises or facilities.
 7. Attached hereto are copies of the applicable policy pages or endorsements regarding notice of cancellation, additional insured and waiver of subrogation matters.

CERTIFICATE HOLDER/ADDITIONAL INSURED CITY OF ROHNERT PARK 130 AVRAM AVENUE ROHNERT PARK, CA 94928	AUTHORIZED REPRESENTATIVE SIGNATURE _____ TITLE _____ PHONE NO. _____
---	---

POLICY NO:

ENDORSEMENT NO:

THIS ENDORSEMENT CHANGES THE POLICY, PLEASE READ IT CAREFULLY

ADDITIONAL INSURED – OWNERS, LESSEES OR CONTRACTORS

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART.

SCHEDULE

Name of Organization:

The City of Rohnert Park, its officers, elected officials, employees, agents and volunteers are named as additional insured.

(If no entry appears above, the information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement).

WHO IS INSURED (Section II) is amended to include as an insured the person or organization shown in the Schedule but only with respect to liability arising out of "your work" performed for that insured.

Modifications to ISO for CG 20 10 11 85

1. The insured scheduled above includes the insured's elected or appointed officers, officials, employees, agents and volunteers.
2. This insurance must be primary as respects the insured shown in the schedule above, or if excess, must stand in an unbroken chain of coverage excess of the Named Insured's scheduled underlying primary coverage. In either event, any other insurance maintained by the Insured scheduled above must be in excess of this insurance and must not be called upon to contribute with it.
3. The insurance afforded by this policy must not be canceled except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to the Entity.
4. Coverage must not extend to any indemnity coverage for the active negligence of the additional insured in any case where an agreement to indemnify the additional insurance would be invalid under Subdivision (b) of Section 2782 of the Civil Code.

Signature-Authorized Representative

Address

CG 20 10 11 85 Insurance Services Office, Inc. Form (Modified)

SUBMIT IN DUPLICATE

**AUTOMOBILE LIABILITY SPECIAL ENDORSEMENT
FOR CITY OF ROHNERT PARK (the "City")**

ENDORSEMENT NO. _____

ISSUE DATE (MM/DD/YY) _____

PRODUCER

Telephone _____

POLICY INFORMATION:

Insurance Company: _____
Policy No.: _____
Policy Period: (from) _____ (to) _____
LOSS ADJUSTMENT EXPENSE Included in Limits
 In Addition to Limits

Deductible Self-Insured Retention (check which) of \$ _____

NAMED INSURED

APPLICABILITY. This insurance pertains to the operation and/or tenancy of the named insured under all written agreements and permits in force with the City unless checked here in which case only the following specific agreements and permits with the City are covered:
CITY AGREEMENTS/PERMITS

TYPE OF INSURANCE

- COMMERCIAL AUTO POLICY
- BUSINESS AUTO POLICY
- OTHER _____

OTHER PROVISIONS

LIMIT OF LIABILITY

\$ _____ per accident, for bodily injury and property damage.

CLAIMS: Underwriter's representative for claims pursuant to this insurance.

Name: _____
Address: _____
Telephone: () _____

In consideration of the premium charged and notwithstanding an inconsistent statement in the policy to which this endorsement is attached or any endorsement now or hereafter attached thereto, it is agreed as follows:

1. **INSURED.** The City of Rohnert Park, its officers, elected officials, employees, agents and volunteers are included as insureds with regard to damages and defense of claims arising from: the ownership, operation, maintenance, use, loading or unloading of any auto owned, leased, hired or borrowed by the Named Insured, or for which the Named Insured is responsible.
2. **CONTRIBUTION NOT REQUIRED.** As respects work performed by the Named Insured for or on behalf of the City, the insurance afforded by this policy must: (a) be primary insurance as respects the City, its officers, officials, employees, agents or volunteers; or (b) stand in an unbroken chain of coverage excess of the Named Insured's primary coverage. Any insurance or self-insurance maintained by the City, its officers, officials, employees and volunteers must be excess of the Named Insured's insurance and not contribute with it.
3. **CANCELLATION NOTICE.** With respect to the interests of the City, this insurance must not be cancelled, except after thirty (30) days prior written notice by receipted delivery has been given to the City.
4. **SCOPE OF COVERAGE.** This policy affords coverage at least as broad as:
 - (1) If primary, Insurance Services Office form number CA0001 (Ed. 1/87), Code 1 ("any auto"); or
 - (2) If excess, affords coverage which is at least as broad as the primary insurance forms referenced in the preceding section (1).

Except as stated above nothing herein must be held to waive, alter or extend any of the limits, conditions, agreements or exclusions of the policy to which this endorsement is attached.

ENDORSEMENT HOLDER

CITY

**CITY OF ROHNERT PARK
130 AVRAM AVENUE
ROHNERT PARK, CA 94928**

AUTHORIZED REPRESENTATIVE Broker/Agent Underwriter _____

I _____ (print/type name), warrant that I have authority to bind the above-mentioned insurance company and by my signature hereon do so bind this company to this endorsement.

Signature _____
(original signature required)

Telephone: () _____ Date signed: _____

REV. 11/08

PART 2 – SPECIAL PROVISIONS

SPECIAL PROVISIONS

2.01 PROJECT OWNER

The Project Owner is the City of Rohnert Park, California. Wherever in these or the Standard Specifications the word "Owner" appears, it must be interpreted to mean the City of Rohnert Park.

2.02 LOCATION AND DESCRIPTION OF WORK

Location of work is within the City of Rohnert Park, at Honeybee Pool located at 1170 Golf Course Drive.

The work generally consists of, but is not limited to the following items and appurtenances as shown on the plans and specified in these Special Provisions;

- Pool refinishing
- Replace handrail to pool
- Replace pool deck exceeding 2% at path of travel to restrooms, concession and pool lift area, move ADA lift to other side by the lifeguard stand.
- Replace drinking fountain
- Sidewalk repairs
- Replace perimeter fence and entry gates
- Remove existing wading pool and replace with concrete pavers
- Concession building:
 - Exterior: dry rot repairs and replacement of sheathing and framing, and exterior painting of exterior trims
 - Interior: remove existing overhead coiling door and install overhead coiling service counter door, fix counter height to be ADA compliant, sliding window, laminate-clad wood casework, ADA signage, graphics, exhaust fan replacements, and roof repairs, light fixtures, and all mechanical and electrical work affected by the ADA improvement work
- Restroom building:
 - Exterior: replace siding and trim and remove privacy screens
 - Interior: ADA improvements including floor and wall finishes, toilet partitions, removal and installation of plumbing fixtures, shower pans, folding shower and dressing seats, folding baby changing stations, toilet accessories, replace doors and door frames

2.03 INSURANCE

INSURANCE REQUIREMENTS FOR CONTRACTORS

The following parties or entities must be listed as additional insured by endorsement:

- A. The City of Rohnert Park, its officers, elected officials, employees, agents and volunteers

BIDDER'S ATTENTION IS DIRECTED TO THE INSURANCE REQUIREMENTS BELOW. IT IS HIGHLY RECOMMENDED THAT BIDDERS CONFER WITH THEIR RESPECTIVE INSURANCE CARRIERS OR BROKERS TO DETERMINE IN ADVANCE OF BID SUBMISSION THE AVAILABILITY OF INSURANCE CERTIFICATES AND ENDORSEMENTS AS PRESCRIBED AND PROVIDED HEREIN. IF AN APPARENT LOW

BIDDER FAILS TO COMPLY STRICTLY WITH THE INSURANCE REQUIREMENTS, THAT BIDDER MAY BE DISQUALIFIED FROM AWARD OF THE CONTRACT.

Contractors must procure and maintain for the duration of the contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, the contractor's agents, representatives, employees or subcontractors. The coverage of the above-named parties as additional insureds shall be "primary and non-contributory" and must state that it will not seek contribution from the City's insurance or self-insurance. The cost of Contractor's insurance must be included in the Contractor's bid. The Notice to Proceed with the Work will not be issued, and the Contractor must not commence work, until such insurance has been approved by the City. Such insurance must remain in full force and effect at all times during the prosecution of the Work and until the final completion and acceptance thereof. In addition, the Commercial General Liability Insurance must be maintained for a minimum of three (3) years after final completion and acceptance of the Work. It must be the Contractor's responsibility to ensure that proof of insurance is sent to the City during this time. The Notice to Proceed does not relieve the Contractor of the duty to obtain such insurance as required herein.

A. Minimum Scope of Insurance

Coverage must be at least as broad as:

1. Insurance Services Office Commercial General Liability coverage (Occurrence Form CG 0001).
2. Insurance Services Office form number CA 0001 (Ed. 1/87) covering Automobile Liability, Code 1 "any auto" or the exact equivalent. If Contractor owns no vehicles, this requirement may be satisfied by a non-owned auto endorsement to the general liability policy described above. If Contractor or Contractor's employee(s) will use personal autos in any way on this project, Contractor must provide evidence of personal auto liability coverage for each such person.
3. Workers' Compensation and Employers Liability: Workers' Compensation on a state-approved policy form providing statutory benefits as required by law with employer's liability insurance, with minimum limits of Two Million Dollars (\$2,000,000) per occurrence.

Coverage must not extend to any indemnity coverage for the active negligence of the additional insured in any case where an agreement to indemnify the additional insured would be invalid under Subsection (b) of Section 2782 of the Civil Code.

B. Minimum Limits of Insurance

Contractor must maintain limits no less than:

1. Commercial General Liability: \$2,000,000 per occurrence for bodily injury, personal injury and property damage and \$2,000,000 general aggregate. It is permissible to use excess/umbrella coverage to meet limit requirements provided the umbrella policies are appropriately endorsed and meet all other requirements. Additionally, a letter clearly identifying the primary policy or policies to which the excess umbrella coverage applies must be submitted attesting to the following: *"Umbrella or excess liability policies must provide coverage at least as broad as specified for underlying coverages and covering those insured in the underlying*

policies. Coverage must be “pay on behalf”, with defense costs payable in addition to policy limits. There must be no cross liability exclusion of claims or suits by one insured against another, and such coverage must also apply on a primary and non-contributory basis for the benefit of the City before the City’s own insurance or self-insurance shall be called upon to protect it as a named insured.”

2. Automobile Liability: \$2,000,000 combined single limit per accident for bodily injury and property damage.
3. Workers' Compensation and Employers Liability: Workers' Compensation providing statutory benefits as required by the Labor Code of the State of California with employers liability insurance, with minimum limits of \$2,000,000 per accident or disease.

Contractor agrees that any available insurance proceeds broader than or in excess of these specified minimum coverage requirements or the limits in subsection (A) shall be available to the additional insureds named above. Furthermore, the requirements for coverage and limits shall be (1) the minimum coverage and limits specified herein; or (2) such broader coverage and maximum limits of coverage of any insurance policy or proceeds available to the named insured for the work performed; whichever is greater.

C. Deductibles and Self-Insured Retentions

Any deductibles or self-insured retentions must be declared to and approved by the City. At the option of the City, either: the insurer must reduce or eliminate such deductibles or self-insured retentions as respects the City, its officers, elected officials, employees, agents, and volunteers; or the Contractor must procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

D. Other Insurance Provisions

The policies are to contain, or be endorsed to contain, the following provisions:

1. General Liability and Automobile Liability Coverages
 - a. The City, its officers, elected officials, employees, agents and volunteers are to be covered as insureds as respects: liability arising out of activities performed by or on behalf of the Contractor, including the insured's general supervision of the Contractor; products and completed operations of the Contractor, premises owned, occupied or used by the Contractor, or automobiles owned, leased, hired or borrowed by the Contractor. The coverage must contain no special limitations on the scope of protection afforded to the City, its officers, elected officials, employees, agents or volunteers.
 - b. The Contractor's insurance coverage must be primary insurance as respects the City, its officers, elected officials, employees, agents and volunteers. Any insurance or self-insurance maintained by the City, its officers, elected officials, employees, agents or volunteers must be in excess of Contractor's insurance and must not contribute with it.
 - c. Any failure to comply with reporting provisions of the policies must not affect coverage provided to the City, its officers, elected officials, employees, agents or volunteers.

d. The Contractor's insurance must apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

2. Workers' Compensation and Employers Liability Coverage

The insurer must agree to waive all rights of subrogation against the City, its officers, elected officials, employees, agents and volunteers for losses arising from work performed by Contractor for the City.

3. All Coverages

a. Each insurance policy required by this clause must be endorsed to state that coverage must not be suspended, voided, cancelled by either party, reduced in coverage or in limits except after thirty (30) days' prior written notice by certified mail, return receipt requested, has been given to the City.

b. **Coverage must not extend to any indemnity coverage for the active negligence of the additional insured in any case where an agreement to indemnify the additional insured would be invalid under Subsection (b) of Section 2782 of the Civil Code.**

E. Acceptability of Insurers

Insurance is to be placed with insurers with a Best's rating of no less than A:VII or as approved by the City.

F. Verification of Coverage

Contractor must furnish the City with certificates of insurance and with original endorsements affecting coverage required by this clause. The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The certificates and endorsements are to be on forms provided by the City. Where by statute, the City's workers' compensation-related forms cannot be used, equivalent forms approved by the Insurance Commissioner are to be substituted. All certificates and endorsements are to be received and approved by the City before work commences. The City reserves the right to require complete, certified copies of all required insurance policies, at any time.

G. Subcontractors

Contractor must include all subcontractors as insureds under its policies or must furnish separate certificates and endorsements for each subcontractor. All coverages for subcontractors must be subject to all of the requirements stated herein.

2.04 BONDS

In accordance with Section 3.4 of the Standard Specifications, the Contractor must provide the following bonds:

Payment Bond equal to 100% of the Contract Bid Price, and Performance Bond equal to 100% of the Contract Bid Price on City's forms. Both bonds must, by its term, remain in full force and effect for a period of one (1) year after the completion and acceptance of said work to guarantee the replacing or making acceptable of any defective materials or faulty workmanship.

The Contractor may elect to post a maintenance bond equal to 100% of the contract bid price, which will run for one year after completion and acceptance of said work to guarantee replacing or making acceptable any defective materials or faulty workmanship prior to the acceptance of said work.

2.05 LIQUIDATED DAMAGES

In accordance with Section 8.6 of the Standard specifications, Liquidated Damages shall be agreed to amount to \$4,200.00 per calendar day.

2.06 WITHDRAWALS OF PROPOSALS

The City reserves the right to reject any and all bids and to waive any informality or irregularity in the bids received.

No bidder may withdraw his/her bid for a period of ninety (90) days from the opening thereof.

2.07 DRAWINGS AND SPECIFICATIONS

The drawings showing location and character of work are entitled Honeybee Pool Renovation, numbered A.01 through GBS-03 inclusive, and are included as a part of these specifications. The City of Rohnert Park 2010 Manual of Standards, Details and Specifications are the adopted Standard Plans for the City of Rohnert Park and are included as a part of these specifications.

Also included by reference as part of these specifications are the Standard Specifications of the CITY OF ROHNERT PARK, Sections 1-10 inclusive, hereinafter referred to as GENERAL PROVISIONS.

In addition, the technical provisions of the Standard Plans and Standard Specifications, State of California, Department of Transportation, Business and Transportation Agency, most current edition, and to revisions thereof are included by reference as a part of these specifications insofar as they refer to materials and methods of work where applicable. Wherever in the SPECIAL PROVISIONS reference is made to Caltrans STANDARD SPECIFICATIONS or Caltrans STANDARD PLANS, it is these specifications or plans referred to.

2.08 COOPERATION AND COLLATERAL WORKS

The Contractor must conform to the provisions of Section 7.26, "Cooperation and Collateral Works," of the STANDARD SPECIFICATIONS.

The Contractor must ascertain the nature and extent of any simultaneous collateral work and must coordinate his operations and cooperate to minimize interference.

2.09 PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS

The Contractor must conform to the provisions of Section 7.15, "Preservation of Property," of the STANDARD SPECIFICATIONS.

Without additional compensation, the Contractor may remove and replace, in a condition as good as or better than original, such small miscellaneous structures as fences and sign posts, that interfere with the Contractor's operations.

All costs to the Contractor for protecting, removing, modifying, relocating and restoring existing improvements must be considered as included in the contract prices paid for the various items of work, and no additional allowance will be made therefor.

2.10 PERMITS AND LICENSES

The Contractor must have a valid California contractor's license, a Class B license. The Contractor and all subcontractors will be required to obtain a City Business license.

The City has already acquired the necessary permits for this project as stated below and documented in Part 5 - Permits.

- City of Rohnert Park Building Permit #CB22-0034
- Sonoma County Department of Health Services Pool Permit #SR0018578
- Sonoma County Department of Health Services Food Program Permit #SR0018862

2.11 APPROVED DEBRIS HAULERS

There are three approved debris haulers within the City and contact information is listed below. The Contractor shall contract with one of the three debris haulers for service on the project. Payment for debris hauling shall be included within the Contractor's bid and no additional payment will be made for using one of the three approved debris haulers.

Industrial Carting (Global Materials Recovery Services C&D Recycling Facility) (707) 585-0511	Recology Sonoma Marin 800-243-0291 https://www.recology.com/recology-sonoma-marin/	Pacific Sanitation 707-838-2597 http://www.pacificsanitation.com/
--	--	---

When the Contractor utilizes a staging area or storage yard that is fenced and screened, final cleanup of the staging area and storage yard will be completed before the fence and screen are removed, except for spot cleanup or trimming that may be required in areas directly under or adjacent to the fence and screen.

Unless expressly waived by the City Engineer, when the contractor utilizes an area for storage of material or staging its activities, the area will be fenced and locked and all fencing will be installed with protective screening (i.e., green screen) to minimize the visual impact of the storage and staging area.

2.12 FIELD REVIEW PRIOR TO BIDDING

The bidder must examine carefully the site of the work contemplated and the proposal, plans, specifications, and the contract forms therefor. It will be assumed that the bidder has investigated and is satisfied as to the conditions to be encountered, as to the character, quality and quantities of work to be performed and materials to be furnished, and as to the requirements of these specifications, the Special Provisions, and the contract.

2.13 TESTING

The City of Rohnert Park will only pay for passing compaction tests meeting the requirements of these specifications. All failing tests will be charged to the Contractor and the costs of such failing tests will be deducted from the contract. In addition, the decision as to when and from what areas tests are to be made will be at the judgment of the Engineer only.

2.14 WORKING HOURS AND RECORD DRAWINGS

Contractor working hours shall be between 8AM and 6PM unless approved by the City Engineer at least 72 hours in advance. Working days shall be Monday through Friday, excluding weekend and holidays.

Record drawings shall be provided at the end of the project by the contractor, and final payment shall not be issued until completed and approved by the project manager. The record drawing compilation shall be considered part of the bid amount.

2.15 PROJECT NOTIFICATION AND IDENTIFICATION SIGN

The Contractor shall supply one 4' X 8' sign to be displayed at the project site as approved by the Engineer in wording to be provided by the City. The signs shall be constructed in accordance with City STD 742. The contractor shall remove the signs when construction is complete.

2.16 CORONAVIRUS RISKS AND CONSTRUCTION REQUIREMENTS

As of this date of this contract, the extent and impact of Coronavirus (also known as “COVID-19”) on this project, including with respect to supplies, materials, and labor, may not be known by the parties. Nevertheless, Contractor acknowledges the need to reasonably foresee the extent and impact of COVID-19; warrants that it has taken such risks into account in preparing its bid and procuring supplies, materials, and labor; and shall be deemed to have assumed the risks associated with COVID-19 by Contractor’s voluntary entry into this Contract, except as otherwise expressly stated in the Contract Documents.

Contractor hereby acknowledges that it has investigated and is familiar with and shall comply with applicable health orders and construction field safety protocols established by the Health Officer of the County of Sonoma. Contractor shall establish any required Code of Safety Practices and designate a Site Safety Representative as may be required under such orders. Contractor acknowledges that it may be subject to further requirements that may be imposed by State Public Health Officer. Contractor hereby acknowledges that compliance with such requirements constitutes part of the Scope of Work under this Contract.

PART 3 – STANDARD SPECIFICATIONS

**PART 3
CONDITIONS OF THE CONTRACT**

SECTION 1

DEFINITIONS AND TERMS

Whenever in these specifications, or in any documents or instruments where these specifications govern, the following terms, or pronouns in place of them, are used, the intent and meaning must be interpreted as follows (except as the context requires a different meaning):

Abbreviations

AAI	American Asphalt Institute
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AISC	American Institute Steel Construction
AISI	American Iron and Steel Institute
API-ASME	American Pressure Institute - American Society of Mechanical Engineers
AREA	American Railway Engineering Association
ASA	American Standards Association
ASTM	American Society for Testing Materials
AWPA	American Wood Preservers Association
AWA	American Welding Society
AWWA	American Water Works Association
CRA	California Redwood Association
DFPA	Douglas Fir Plywood Association
NEMA	National Electrical Manufacturers' Association
WCLA	West Coast Lumbermen's Association

Acceptance

The formal written acceptance by the City of an entire Contract which has been completed in all respects in accordance with the plans and specifications and any modifications thereof previously approved.

Bidder

Any individual, firm or corporation submitting a proposal for the work contemplated, acting directly or through a duly authorized representative.

City

City of Rohnert Park

City Engineer

The City Engineer of the City of Rohnert Park.

Contract or Contract Documents

The Contract or agreement to be entered into by the successful bidder for the performance of the

work must consist of the following documents, each of which is on file in the office of the City Clerk and all of which are incorporated in the Contract and made a part thereof by reference thereto: Contract, Invitation for Sealed Proposals, Instructions and Information to Bidders, Accepted Proposal, Performance Bond, Payment Bond, Special Provisions, Standard Specifications, Design and Construction Standards, Plans, Profiles and Detailed Drawings.

Contractor

The word “Contractor” must mean the person, persons, partnership or corporation entering into a Contract for the performance of the work required and the legal representative of said party of the agent appointed to act for said party in the performance of the work.

Contract Prices

Either the unit prices or lump sum amounts to be named in the Contract, or the total of all payments under the Contract at the unit prices or lump sum amounts, as the case may be. This definition is for convenience and reference only, and must not be construed to alter the fact that the Contract is an entire Contract for the performance of all work depicted on the plans and as described herein.

Directed

Whenever in these specifications the words “directed,” “required,” “permitted,” “ordered,” “instructed,” “designated,” “considered necessary,” “prescribed,” or words of like import are used, it must be understood that the directions, requirements, permission, order, instruction, designation, or prescription, etc. of the City Engineer are intended; and, similarly, the words “approved,” “acceptable,” “satisfactory,” or words of like import, must mean approved by, or acceptable or satisfactory to the City Engineer, unless otherwise stated.

Engineer

Engineer must mean properly authorized engineers, inspectors, and superintendents acting severally within their scope of the particular duties entrusted to them by the City Engineer.

Federal Agencies

Whenever in these specifications reference is made to any Federal Agency or officer, such references must be deemed made to any agency or officer succeeding in accordance with law to the powers, duties, jurisdictions and authority of the agency or officer mentioned.

Inspector

The word “Inspector” must mean the authorized individual or firm acting within the jurisdiction entrusted to it by the City Engineer.

Plans

The Plans must mean collectively all of the drawings or plans referenced by the project specifications and made a part thereof, and also such supplemental drawings or plans as the City Engineer must issue from time to time in order to elucidate drawings or plans attached to these specifications, or for showing details which are not shown thereon, or for the purpose of showing changes in the work, as authorized in later paragraphs describing changes and extra work.

Specifications

The directions, provisions, and requirements contained herein as supplemented by such special provisions or special specifications as may be necessary, pertaining to the method and manner of

performing the work or the quantities and qualities of materials to be furnished under the Contract. The special provisions or special specifications are specified clauses setting forth conditions or requirements peculiar to the project under consideration and covering work or materials involved in the proposal and estimate but not satisfactorily covered by these Standard Specifications.

State

State of California.

Supervision

The word “supervision” where used in these specifications to indicate supervision by the City Engineer must mean the performance of obligations and the exercise of rights specifically imposed and granted upon and to the City in becoming a party to the Contract, of which the text of these specifications form a part. Excepting as specifically stated herein, supervision by the City must not be construed to mean active and direct superintendence of the details of work.

Surety

The word “surety” or “sureties” must mean the bondsmen or party or parties who may guarantee the fulfillment of the Contract by bond, and whose signatures are attached to said bond.

SECTION 2

PROPOSAL REQUIREMENTS AND CONDITIONS

2.1 INTENT

It is the intent of these specifications that the provisions of all sections must apply unless otherwise specified in the Special Provisions, in which case the provisions contained therein must have precedence over those specified in the Standard Specifications. It is also the intent where reference is made to specifications or other organizations for portions of the work, that such reference must apply only to construction methods and materials used in said work.

SECTION 3

AWARD AND EXECUTION OF CONTRACT

3.1 AWARD OF CONTRACT

The City reserves the right to accept or reject any or all proposals and waive technical defects as the best interests of the City may require. Award of the Contract, if it be awarded, will be to the lowest responsive, responsible bidder whose proposal complies with all the requirements prescribed. The award, if made, will be awarded as soon as practicable after the opening of the proposals but not before the time for bid protests set forth below. Proposals in which the prices are obviously unbalanced will be rejected.

The proposals will be compared on a basis of the sum of the totals of the items of the schedule as calculated from the given estimated quantities and the unit prices or lump sums of the amount submitted. The entire work will be awarded to one bidder, unless otherwise specified in the Special Provisions.

3.2 BID PROTESTS

Any bid protest ("Bid Protest") must be filed in writing with the City Clerk, with a copy to the bidder whose bid is being protested, and served by email or facsimile transmission within seven (7) calendar days of the City's issuance of the Notice to Intent to Award for Construction Work. **Proof of service of the Bid Protest must be submitted to the City Clerk within one business day of the filing of the Bid Protest, and any protest without a timely submitted proof of service may be rejected.** The City will use reasonable efforts to deliver by email or facsimile a copy of the Notice of Intent to Award to all bidders who submitted bids no later than the business day after issuance, although any delay or failure to do so will not extend the bid protest deadline described above.

The Bid Protest must state all grounds upon which the protest is based and include all facts and documents in support of each protest ground.

Any bidder whose bid is subject to a protest may submit to the City Clerk a written response ("Response") to the Bid Protest, with a copy to the protesting bidder, and served by email or facsimile transmission within 5 (five) calendar days of the service of the Bid Protest.

The City Clerk shall promptly submit the Bid Protest, and any Response, to the City Manager, Assistant City Manager or his/her designee for decision ("Decision"). The Decision on the Bid Protest shall be in writing and shall be served upon the protesting bidder, and the bidder whose bid is being protested, via email or facsimile transmission within five (5) calendar days of his or her receipt of Bid Protest and any Response. If the City Manager, Assistant City Manager or his/her designee has not issued a written Decision on the Bid Protest within said five (5) calendar day period, then the Bid Protest shall be deemed denied. The Decision, by written Decision or deemed denial, shall be final.

Failure to comply with these Bid Protest Procedures shall be deemed to be a waiver of the right to protest a bid.

3.3 RETURN OF PROPOSAL GUARANTEES

Within 10 days after award of Contract, the City will upon demand return the proposal guarantees

accompanying the proposals of all bidders, except those of the three lowest responsible bidders as determined by the City. Proposal guarantees of such three lowest responsible bidders will be held until the Contract has been finally executed, after which they will be returned to the respective bidders whose proposals they accompany.

3.4 BONDS

Prior to the execution by the City of the Contract, the successful bidder must file good and sufficient bonds to be approved by the City conditioned upon the complete performance of the Contract and upon the payment of claims for labor and materials in connection therewith. The Contractor must pay all premiums and costs thereof and incidental thereto. Such bonds must not be subject to cancellation.

The following minimum thresholds require Payment and Performance bonds for projects over \$25,000.

Payment Bond: Per California Civil Code Section 9550. The payment bond should contain the terms and conditions set forth in Section 9554 of the Civil Code of the State of California, and must be subject to the provisions of that chapter and, in addition, must be in the amounts which are specified in the Special Provisions.

The performance bond must be in an amount specified in the Special Provisions and must be so conditioned as to insure the complete performance of the Contract without exception.

Should any surety or sureties be deemed unsatisfactory at any time by the City, notice will be given to the Contractor to that effect, and he must forthwith substitute a new surety or sureties satisfactory to the City. No further payment must be deemed due or will be made under this Contract until the new surety must qualify and be accepted by the City.

Any alterations in the work to be done, or increase or decrease of the materials to be furnished, which may be made pursuant to the terms of said Contract, must not in any way release either the principal or surety thereunder, nor must any extensions of time granted under the provisions of said Contract release either the principal or surety, and notice of such alterations or extensions of the Contract must be waived by the surety. The bonds must be maintained in full force and effect until the Contract has been completely performed and until all claims for material and labor have been paid.

Once the Notice of Completion has been recorded, Contractor may elect to post a Maintenance Bond equal to 100% of the final Contract Price, including Contract Change Orders, if any, for a period of one-year after the Notice of Completion recorded date.

3.5 EXECUTION OF CONTRACT

The Contract must be signed by the successful bidder and returned, together with the Contract Bonds and valid insurance on City forms, within fifteen (15) calendar days after the date of mailing written notice to the successful bidder that the Contract has been awarded.

3.6 FAILURE TO EXECUTE CONTRACT

Failure to execute a Contract, file acceptable bonds, and/or acceptable insurance as provided herein within said fifteen (15) calendar days shall allow the City, at its discretion, to annul the award and claim the proposal guarantee as provided in the California Public Contract Code. If the successful bidder refuses or fails to execute the Contract, the City may award the Contract to the second lowest

responsible bidder. If the second lowest responsible bidder refuses or fails to execute the Contract, the City may award the Contract to the third lowest responsible bidder. On the failure or refusal of the second or third lowest responsible bidder, to whom any Contract is so awarded, to execute the same, such bidders' guarantees must be likewise forfeited to the City. The work may then be re-advertised or may be constructed by other means as the City may decide.

SECTION 4

SCOPE OF WORK

4.1 WORK TO BE DONE BY CONTRACTOR

The work to be done consists of furnishing all labor, methods or processes, implements, tools, machinery, transportation, insurance, permits, bonds, taxes and materials, except as otherwise specified which are required to renovate the City of Rohnert Park's Honeybee Pool in complete order for use and to leave the grounds in a neat and orderly condition.

Where items contain a description of work to be included for payment under a particular item, such description must be considered as including, but not being limited to, the work described. It must be further understood that it is the intent that the cost of all work necessary for the completion of the particular item must be included in the price proposal for the item, unless the cost of such work is specifically included in another item.

4.2 FINAL CLEANUP

Before final inspection by the City, the Contractor must clean the site and grounds occupied by it in connection with the work of all rubbish, excess materials, falsework, temporary structures, and equipment, and all parts of the work must be left in a neat and presentable condition. Nothing herein, however, must require the Contractor to remove warning and directional signs prior to formal acceptance by the City.

When the Contractor utilizes a staging area or storage yard that is fenced and screened, final cleanup of the staging area and storage yard will be completed before the fence and screen are removed, except for spot cleanup or trimming that may be required in areas directly under or adjacent to the fence and screen.

4.3 CHANGES IN THE CONTRACT - EFFECT BETWEEN PARTIES

The City reserves the right to make such alterations or deviations, additions to or omissions from the plans and specifications, as may be determined during the progress of the work to be necessary and advisable for the proper completion thereof. When such change is ordered, the City Engineer must determine and state in his/her written order to the Contractor made pursuant thereto whether or not in his/her opinion such change constitutes a material change and what adjustment of consideration provided for in the Contract is warranted. Upon written order of the City Engineer, the Contractor must proceed with the work as so increased, decreased or altered. Such action and any disposition thereof may be taken without notice by City to Insurance Underwriters, Sureties, or Guarantors required by this Contract and absence of notice thereto must in no way whatsoever discharge the obligation of any such party.

When the City and the Contractor fail to agree as to whether an omission of a portion of the work or alterations, or deviations or additions to or omissions from the plans and specifications ordered by the Engineer or City constitute a material change or difference in character of work as herein contemplated sufficient to warrant adjustment in the consideration provided to be paid to the Contractor or fail to agree on the consideration adjustment or compensation to be allowed for such change, the Contractor must forthwith proceed with the changed work upon receipt of written order from the City Engineer and the following procedures must become operative.

Pending a settlement of the dispute, the Contractor must file with the City Engineer, within ten (10)

days after receiving such written notice to proceed, a protest setting forth in detail in what particulars the character of the work was changed so as to warrant a consideration adjustment or by what amount the unit cost or other cost was increased or to what extent the consideration demand or reduction in consideration determined by the City Engineer as warranted is excessive. The failure of the parties to agree must in no wise be construed as relieving the Contractor of its duty and responsibility for continuing with performance under the Contract as changed and filing a protest as above provided for. Failure to continue performance under such circumstances must constitute a breach of Contract by the Contractor and the appropriate provisions hereof with relation thereto must apply. The determination of the City Engineer of the amount of reduction in Contract consideration or other consideration to City or increase in consideration or other basis of compensation to Contractor arising out of any such change must be final and binding upon the Contractor, unless it files such a protest as hereinabove provided within ten (10) days after receiving notice from the City Engineer to proceed. Payment by City on the basis of Contract prices so adjusted must constitute full and final performance of City obligation hereunder. If the parties fail to agree prior to completion of the Contract, final payments must not be delayed but must be made in accordance with the City Engineer's determinations subject to further claim of the Contractor and compliance by City with court order, but nothing contained in this clause must excuse the Contractor from proceeding with the prosecution of the work as changed.

4.3.1 Reduction in Cost

If the cost of work to the Contractor is reduced by reason of any modification of the Contract, compensation must be made to the City therefor or proportionate reduction in Contract consideration must be made therefor.

4.3.2 Quantity Changes

The quantities given in the proposal schedule for unit price items are for comparing proposals and may vary from the actual final quantities. Some quantities may be increased and others may be decreased or entirely eliminated, and no claims must be made against the City for damage occasioned thereby or for loss of anticipated profits, the Contractor being entitled only to compensation for the actual work done at the unit prices proposed.

4.3.3 Extra Work

(a) The City reserves and must have the right, when confronted with unpredicted conditions, unforeseen events, or emergencies, to revise the details of the contemplated work or to add work of a different character or function and have the Contractor perform such revised or added work, as extra work, when such extra work is considered by the City Engineer to be vitally appurtenant to the satisfactory completion of the project. Extra Work is defined as added work of a different character or function and for which no basis for payment is prescribed; or that involving revisions of the details of the work in such a manner as to render inequitable payment under items upon which the Contractor proposed; or that work to be done under stipulated prices as given in the Schedule of Bid Prices.

The signing of the Contract by the Contractor will be deemed to be an agreement on its part to perform extra work, as and when ordered by the City Engineer. The Contractor must give notice to the sureties on the Contractor's bonds if the estimated total value of the Contract, as changed or supplemented, must exceed the original total proposal price by more than twenty-five percent (25%), but failure to give such notice must in no way whatsoever affect the surety's obligation under

said bonds. If required extra work results in delay to the work, the Contractor will be given an equivalent extension of time.

(b) Upon decision of the City to have extra work performed, the City Engineer will so inform the Contractor, acquainting it with the details of the new work. Should an item of work within the proposal schedule correspond with the type of work to be done under extra work to the mutual satisfaction of the Contractor and the City, the extra work must be performed at the stipulated bid price and in the manner provided for said item. Should such extra work not correspond to a stipulated bid price, the Contractor must prepare a price for said work based upon its estimate of cost and submit said price and estimate to the City Engineer based on one of the following methods as requested by the City:

(1) For a stated unit price or lump sum amount based upon current prevailing fair prices for materials, labor, plant, overhead, and profit.

(2) On a cost plus markup basis (force account by the Contractor). All work done by the Contractor on a cost plus markup basis will be computed in the manner hereinafter described, and the compensation thus provided must be accepted as payment in full by the Contractor, and no additional payment will be allowed for the use of small tools, superintendent's services, timekeeper's services, nor any other overhead expenses incurred in the prosecution of the force account work.

Total Cost Must Include:

MATERIALS: For all materials purchased by the Contractor and used in this specific work, it will receive the actual cost less normal discounts of such materials, including freight and delivery charges, as shown by original receipted bills. It must be understood, however, that such salvage value, as may be agreed upon between the City and the Contractor for materials which are not permanently incorporated in the work, will be deducted from the total amount as derived above. The City reserves the right to furnish such materials required as it deems advisable, and the Contractor must have no claim for profit on the cost of such materials.

LABOR: For all direct labor engaged in the specific operation, the Contractor will receive the prevailing wage paid on the project for each and every hour that said labor is actually engaged in such work. In addition, the City will reimburse the Contractor for compensation insurance payments; contributions made to the State as required by the provisions of the Unemployment Reserve Act, Chapter 352, Statutes of 1935, as amended; and for taxes paid to the Federal Government, as required by the Social Securities Act, approved August 14, 1935, as amended.

EQUIPMENT RENTAL: For any machine, power and equipment which is deemed necessary, the Contractor must receive the actual cost of rented equipment furnished by it as shown on its paid vouchers.

For the use of equipment owned by the Contractor, it must be paid the rental rates currently prevailing in the locality, and said rental rates must be deemed to include profit and overhead, and no extra compensation will be allowed, nor will any percentage or amount whatsoever be added thereto.

MARKUP:

(i) **Work by Contractor.** A 15% allowance must be added to Contractor's direct

costs and must constitute the markup for all overhead and profit on work by the Contractor. The Contractor must also be compensated for the actual increase in the Contractor's bond premium caused by the extra work.

(ii) **Work by Subcontractor.** When any of the extra work is performed by a Subcontractor, a 15% allowance must be added to the Subcontractor's direct costs and must constitute the markup for all overhead and profit on work by the Subcontractor. In addition, a 5% allowance must also be added to the Subcontractor's direct cost and must constitute the markup for all overhead and profit for the Contractor on work by the Subcontractor. The Contractor must also be compensated for the actual increase in the Contractor's bond premium caused by the extra work.

(c) The Contractor must not commence extra work until it has secured the approval of the City as to the method and amount of payment thereunder, excepting that the City Engineer may, in writing, order the Contractor to proceed with extra work in advance of such approval.

(d) Upon receipt of the Contractor's price, the City Engineer will make an analysis thereof, and the City will adopt one of the following procedures for prosecuting extra work:

(1) Accept the Contractor's price for lump sum or unit price amount in the original or amended form and direct Contractor to proceed with the work; or direct Contractor to perform the work on a cost plus markup basis.

(2) Have the work performed by the City under separate contract, without undue interference or hindrance to the Contractor and without claim or suit by the Contractor for damages on account thereof.

4.4 MAINTENANCE OF DETOURS

The Contractor must construct and maintain detours and detour bridges for the use of public traffic as provided in the Special Provisions, or as shown on the plans or as directed by the Engineer, and payment for such work will be made as set forth in the Special Provisions or at the contract prices for the items of work involved if the work being performed is covered by contract items of work, and no other method of payment therefor is provided in the Special Provisions. Otherwise, the work will be paid for as extra work as specified under Paragraph 4.3 of this section.

When public traffic is routed through the work, provisions for passageway through construction operations will not be considered as detour construction or detour maintenance.

Detours used exclusively by the Contractor for hauling materials and equipment must be constructed and maintained by Contractor at Contractor's expense.

The failure or refusal of the Contractor to construct and maintain detours at the proper time must be sufficient cause for closing down the work until such detours are in satisfactory condition for the use of public traffic.

Where the Contractor's hauling is causing such damage to the detour that its maintenance in a condition satisfactory for public traffic is made difficult and unusually expensive, the Engineer must have authority to regulate the Contractor's hauling over the detour.

4.5 USE OF MATERIALS FOUND ON THE WORK

The Contractor, with the approval of the Engineer, may use in the proposed construction such stone, gravel, sand or other material suitable, in the opinion of the Engineer, as may be found in the

excavation, but it must replace at its own expense with other suitable material all of that portion of the material so removed and used which was contemplated for use in the embankments, backfills, bridge approaches, or otherwise. No charge for materials so used will be made against the Contractor. The Contractor must not excavate or remove any materials from within the project location which is not within the excavation, as indicated by the slope and grade lines, without written authorization from the Engineer.

SECTION 5
CONTROL OF THE WORK

5.1 AUTHORITY OF CITY ENGINEER

The City Engineer must decide all questions which may arise as to the quality or acceptability of materials furnished and work performed and as to the manner of performance and rate of progress of the work and all questions which may arise as to the interpretation of the Plans and Specifications. His/her decision must be final, unless otherwise ordered by the City Manager or Assistant City Manager, and he/she must have authority to enforce and make effective such decisions and orders which the Contractor fails to carry out promptly.

5.2 PLANS

The approved Plans are hereby made a part of these Specifications. These Plans show in general the nature and dimensions of the work to be done. It is hereby understood that changes may be made according to the best interests of the City.

5.3 CONFORMITY WITH PLANS

Finished surfaces in all cases must conform with the lines, grades, cross sections, and dimensions shown on the approved plans. Deviations from the approved plans and working drawings, as may be required by the exigencies of construction, will in all cases be determined by the City Engineer and must be authorized in writing by him/her.

The Contractor must have Plans and Specifications for the project on the project location at all times and must make these Plans and Specifications available to the Engineer upon request.

5.4 WORKING DRAWINGS

The Contractor must submit such working drawings, in quadruplicate, as required by the Special Provisions. Working drawings for any structure must consist of such detailed plans as may be required for the prosecution of the work and are not included in the plans furnished by the City. They must include shop details, erection plans, masonry layout diagrams, and bending diagrams for reinforcing steel, which must be approved by the Engineer before any work involving these plans is performed. Plans for cribs, cofferdams, falsework, centering, and form work will be required and must be subject to approval, unless approval is waived by the Engineer. These plans will be subject to approval insofar as the details affect the character of the finished work, but other details of design will be left to the Contractor, who must be responsible for the successful construction of the work.

It is expressly understood, however, that approval by the Engineer of the Contractor's working drawings does not relieve the Contractor of any responsibility for accuracy of dimensions and details, or for mutual agreement of dimensions and details.

Full compensation for furnishing all working drawings must be considered as included in the prices paid for the various Contract items of work, and no additional allowance will be made therefor.

5.5 COORDINATION OF PLANS, SPECIFICATIONS, AND SPECIAL PROVISIONS

These Specifications, the Plans, Special Provisions, Contract Change Orders, and all supplementary documents are essential parts of the Contract, and a requirement occurring in one is binding as though occurring in all. They are intended to be cooperative and to describe and provide for a complete work.

In case of discrepancy either in the Plans or Specifications, the matter must be promptly submitted to the City Engineer who must make a determination in writing. Any adjustment by the Contractor without this determination must be at its own risk and expense. If the Contractor, in the course of the work, finds any discrepancy in the Plans in the physical conditions of the locality or any errors or omissions in the Plans or in the layout as given by survey points and instructions, it must immediately notify the Engineer in writing who must promptly verify the same. Any work or material not herein specified or shown on the Plans, but which be fair implication in the judgment of the City Engineer, should be included therein, must be done or furnished as a part of the Contract as though shown or included in the Plans or Specifications. Any work done after such discovery, until authorized, must be done at the Contractor's risk.

5.6 INTERPRETATION OF PLANS AND SPECIFICATIONS

Should it appear that the work to be done or any of the matter relative thereto are not sufficiently detailed or explained in the Plans and Specifications, the Contractor must apply to the Engineer for such further explanations as may be necessary and must conform to them as part of the Contract, so far as may be consistent with the original Specifications; and in the event of any doubt or question arising respecting the true meaning of the Specifications, reference must be made to the City Engineer, whose decision thereon must be final.

In the event of any discrepancy between any Plans and the figures written thereon, the figures must be taken as correct.

5.7 SUPERINTENDENCE

Whenever the Contractor is not present on any part of the work where it may be desired to give direction, orders will be given by the Engineer, which must be received and obeyed by the superintendent or foreman or authorized representative who may have charge of the particular work in reference to which the orders are given. Any order given by the Engineer, not otherwise required by the Specifications to be in writing, will, on request of the Contractor, be given or confirmed by the Engineer in writing.

An authorized representative of the Contractor must be present at the site of the work at all times, both while work is actually in progress of the Contract and during periods when work is suspended.

Where the Contractor is comprised of two or more persons, co-partnership or corporations, functioning on a joint venture basis, said Contractor must designate in writing to the City the name of their authorized representative who must have supreme authority to direct the work and to whom orders will be given by the Engineer, to be received and obeyed by the Contractor.

The Contractor must have a sufficient number of superintendents or foremen on the site of the work to adequately supervise and direct each major type of its construction work, and when, in the opinion of the Engineer, the Contractor's required supervisory personnel are considered inadequate, the Contractor, upon request from the City, must promptly provide adequate personnel.

5.8 LINES, GRADES AND MEASUREMENTS

Initial staking out of the work will be done by the Contractor, unless otherwise stated in the Special Provisions. The Contractor will establish control lines and offset lines and set all stakes normally required in order that the Contractor can make the necessary measurements therefrom for the layout of the details of its work without the need for surveyors. Survey stakes and bench marks removed by the carelessness of the Contractor or its employees will be replaced by the City at the Contractor's

expense.

The Contractor must employ skilled personnel for making measurements and skilled mechanics for setting equipment or metal parts that are to be permanently imbedded in or attached to proposed structures. Any inaccuracies in the placing of equipment or metal parts must be remedied by the Contractor at its own cost. Any inaccuracies in the performance of the Contractor's work due to faulty transfer or measurements must be remedied by the Contractor at its own expense.

5.9 INSPECTION

5.9.1 Except as otherwise provided in paragraph 5.9.4 below, all material and workmanship, if not otherwise designated by the Specifications, must be subject to inspection, examination and test by the Engineer at any and all times during manufacture and/or construction and at any and all places where such manufacture and/or construction are carried on. The Engineer must have the right to reject defective material and workmanship or require its correction. Rejected workmanship must be satisfactorily corrected, and rejected material must be satisfactorily replaced with proper material without charge therefor, and the Contractor must promptly segregate and remove the rejected material from the premises. If the Contractor fails to proceed at once with the replacement of rejected material and/or the correction of defective workmanship, the Engineer may by Contract or otherwise replace such material and/or correct such workmanship and charge the cost thereof to the Contractor, or may terminate the right of the Contractor to proceed.

5.9.2 The Contractor must furnish promptly without additional charge, all reasonable facilities, labor, and materials necessary for the safe and convenient inspection and tests that may be required by the Engineer. All inspection and tests by the Engineer must be performed in such a manner as not unnecessarily to delay the work. Special, full size, and performance tests must be as described in the Specifications. The Contractor must be charged with any additional cost of inspection when material and workmanship are not ready at the time inspection is requested by the Contractor.

5.9.3 Inspection of material and finished articles to be incorporated in the work at the site must be made at the place of production, manufacture, or shipment, whenever the quantity justifies it, unless otherwise stated in the Specifications; and such inspection and written or other formal acceptance, unless otherwise stated in the Specifications, must be final, except as regards latent defects, departures from specific requirements of the Contract, damage or loss in transit, frauds, or such gross mistakes amount to fraud. Subject to the requirements contained in the preceding sentence, the inspection of material and workmanship for final acceptance as a whole or in part must be made at the site. Nothing contained in this paragraph must in any way restrict the City's rights under any warranty or guarantee. No work must be covered by a succeeding operation until the Engineer has had adequate notice and a sufficient opportunity to inspect the work. Any violation of this requirement will be deemed an attempt to defraud the City, and the work covered may be rejected. The Contractor must comply promptly with the instructions of the Engineer. Failure to so comply must be sufficient cause for breach of Contract. The Engineer may, when in the best interests of the City, order a suspension of the work or any part of the work which is not, in his/her opinion, proceeding satisfactorily.

The inspection of the work must not relieve the Contractor of any of its obligations to fulfill its Contract as prescribed.

5.9.4 Should it be considered necessary or advisable by the Engineer at any time before final acceptance of the entire work to make an examination of work already completed, and upon which

adequate notice and sufficient opportunity for inspection was as provided in the previous paragraph, by removing or tearing out same, the Contractor must on request promptly furnish all necessary facilities, labor, and material. If such work is found to be defective or non-conforming in any material respect due to fault of the Contractor or its Subcontractors, it must defray all the expense of such examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the Contract, the actual direct cost of labor and material necessarily involved in the examination and replacement, plus markup as determined in Section 4.3, must be allowed the Contractor, and it must, in addition, if completion of the work has been delayed thereby, be granted a suitable extension of time on account of the additional work involved.

5.9.5 All inspection by the City, the Engineer, or the Engineer's representative is for the use by the City in determining the acceptability of the project by the Engineer. The Contractor is responsible for the quality of all materials supplied and all workmanship. The Contractor must provide and implement a quality control program independent of the inspections provided by the City. Such quality control program must be designed to ensure materials and workmanship are of first quality in conformance with these specifications and the best practices of the construction industry. The contractor's quality control plan must be submitted to the Engineer for review within 15 days of Notice to Proceed. Approval of the quality control plan by the Engineer does not relieve the contractor of providing sufficient tests or certifications to provide a complete and useable product in accordance with these specifications.

5.10 UNAUTHORIZED WORK AND DEFECTIVE WORK OR MATERIALS

Any work done beyond the scope of the Plans, Specifications, established by the City Engineer, or any extra work done without written authority, will be considered as unauthorized and will not be paid for. Work so done may be ordered removed at the Contractor's expense. Upon failure on the part of the Contractor to comply promptly with any order of the Engineer made under the provisions of this Section 5, the City Engineer must have authority to cause defective work or materials to be remedied or removed and replaced, and unauthorized work to be removed, and to deduct the cost from any moneys due or to become due the Contractor notwithstanding that such defective work and materials have been previously overlooked by the Engineer and accepted or estimated for payment.

5.11 METHODS AND EQUIPMENT

Equipment not suitable to produce the quality of work required will not be permitted to operate on the project. If the City Engineer or representative observes unsuitable equipment, the City Engineer shall have the right and authority to stop work. Contractor shall not be granted extra additional days or compensation for delay due to Contractor's use of unsuitable equipment.

Plants must be designed and constructed in accordance with general practice for such equipment and must be of sufficient capacity and of such character to insure the production of sufficient material to carry the work to completion within the time limit.

The Contractor must provide adequate and suitable equipment and plants to meet the above requirements and, when ordered by the Engineer, must remove unsuitable equipment from the work and discontinue the operation of unsatisfactory plants.

Each machine or unit of equipment must be operated by a person experienced in handling the particular make of machine or unit of equipment in use, at a speed or rate of production not to exceed that recommended by the manufacturer.

All vehicles used to haul materials over existing highways must be equipped with pneumatic tires. Beam scales for use in batchers, proportioning plants, platform scales, or for other purposes must be equipped with "V" blocks and pivots of hard steel in all hangers or other points of support which are used as parts of the weighing mechanism.

5.12 FINAL INSPECTION AND ACCEPTANCE

The work will be inspected by the City for acceptance promptly upon receipt of notice in writing, for the Contractor, that the work required under the Contract has been performed.

If, in the judgment of the City Engineer, the work has been completed in accordance with the Plans and the Specifications and is ready for acceptance, he/she will so certify and accept the completed work in accordance with the City's approved procedures. The City Engineer will, in his/her certification to the City, give the date upon which the work was completed. Upon acceptance by the City pursuant to such certification, the date of completion as certified by the City Engineer will be the date of completion of work up to which penalties for liquidated damages, if any, will be computed.

5.13 CLEANUP WORK

During construction the Contractor must keep the site reasonably free and clear from all rubbish and debris. Care must be taken to prevent spillage when hauling is being done on any public road or street, and any such spillage or debris resulting from the Contractor's operation must be immediately cleaned up.

Upon the completion of the work, the Contractor must remove all plants, building, rubbish, unused materials, concrete forms and other like material belonging to it or used under its direction during the construction. In the event of its failure to do so, the same may be removed by the City at the expense of the Contractor.

SECTION 6

CONTROL OF MATERIALS

6.1 CITY-FURNISHED MATERIALS

The Contractor must notify the City as to the time at which it will require those materials which are to be furnished by the City. This notice must be given in sufficient advance of actual need to avoid delay.

City-furnished materials will be delivered Freight on Board (f.o.b.) trucks at the site of the work. The site of the work must be construed as meaning the nearest point to the work which is readily accessible to trucks. The Contractor will be charged with any standby or demurrage charges which may accrue at the point of delivery because of his failure to unload the trucks immediately upon their arrival at the site of work.

The Contractor must receive and be responsible for these materials, storing those which may be damaged by the elements, in a safe, substantial manner until they are used in the work.

Any materials delivered in an acceptable condition to the Contractor by the City and subsequently lost to or rejected by the City due to damages from handling, transporting, storing, flood waters, fire, or for any other reasons before its acceptance in the completed work, must be paid for by the Contractor. The total value of such materials will be deducted from moneys due or becoming due the Contractor. Any condemned material must be immediately and permanently removed from the site of work by the Contractor.

Any of the City's materials, remaining unused after all requirements for said materials have been met, must be promptly returned to the City in acceptable condition. These materials must be returned by the Contractor f.o.b. the City's truck at the site of work and at such points as will be conveniently accessible to City transportation.

The Contractor must not sell, assign, mortgage, hypothecate, or remove equipment or materials which have been installed or delivered and which may be necessary for the completion of the Contract, without the formal consent of the City.

6.2 MATERIALS TO BE FURNISHED BY THE CONTRACTOR

Unless otherwise specified herein, or on the Plans and Specifications, the Contractor must furnish all materials required for the completion of the Contract. The cost of hauling, storing and handling of all the materials required to be furnished by the Contractor must be included in the unit price proposal in the schedule for the work for which the materials are required.

6.3 SOURCE OF SUPPLY AND QUALITY OF MATERIALS

It must be the Contractor's responsibility to require material suppliers and Subcontractors to furnish materials which meet the requirements of the Specifications. All materials which are to become part of the completed project must be new and must conform to the requirement prescribed therefor in these Specifications or as specified in the Special Provisions.

Unless otherwise waived in writing by the Engineer, the Contractor will be required to furnish the City with certification prepared and signed by the manufacturer and/or supplier to the effect that items furnished meet all the requirements of the Specifications. Such certification must be furnished prior to the use of the material in any part of the construction.

In the case of sand and gravel to be used for concrete construction, the Contractor must notify the City's representative in writing, the sources of the available materials and secure source approval in writing prior to placing order for delivery of this material to the job site.

6.4 WATER AND ELECTRIC POWER

Unless otherwise indicated in the proposal schedules, the responsibility must be upon the Contractor to provide, pay all cost for, and maintain at his own expense an adequate supply of water and electric power of a quality suitable for its construction and domestic purposes.

The Contractor must indemnify, defend, and save harmless the City against any and all claims or suits for damages arising from its acquisition and use of electric power and water.

6.5 MATERIALS AND WORKMANSHIP; WARRANTY

All material furnished by the Contractor must be of the specified quality and equal to approved samples, if samples have been submitted. All work must be performed and completed in a thorough, workmanlike manner, notwithstanding any omission from the Plans and Specifications. All work done and all materials furnished must comply with these Specifications to the satisfaction of the City.

Materials furnished by the Contractor and condemned by the Engineer as being unfit for use must be immediately and permanently removed from the site of work. Unused materials, except such as furnished by the City, must remain the property of the Contractor.

Contractor warrants that all construction services shall be performed in accordance with generally accepted professional standards of good and sound construction practices, all Contract Documents requirements, and all laws, codes, standards, licenses, and permits. Contractor warrants that all materials and equipment shall be new, of suitable grade of their respective kinds for their intended uses, and free from defects. Contractor hereby grants to City for a period of one year following the date of completion its unconditional warranty of the quality and adequacy of all of the Work including, without limitation, all labor, materials and equipment provided by Contractor and its Subcontractors of all tiers. If either prior to completion of the Work, or within one year after completion, any Work (completed or incomplete) is found to violate any of the foregoing warranties (Defective Work), Contractor shall promptly, without cost to City and in accordance with City's written instructions, correct, remove and replace the Defective Work with conforming Work, and correct, remove and replace any damage to other Work or other property resulting therefrom. If Contractor fails to do so, Contractor shall pay all of the City's resulting claims, costs, losses and damages. Where Contractor fails to correct Defective Work, or defects are discovered outside the correction period, City shall have all rights and remedies granted by law.

6.6 STORAGE OF MATERIALS

Materials must be so stored as to insure the preservation of their quality and fitness for the work. When considered necessary by the Engineer, they must be placed on wooden platforms or other hard, clean surfaces and not on the ground. They must be placed under cover when so directed. Stored materials must be so located as to facilitate prompt inspection.

6.7 SAMPLES AND SPECIMENS

The Contractor must submit specimens or samples of materials to be used in the work as the

Engineer may require.

6.8 TRADE NAMES AND ALTERNATIVES

For convenience in designation on the Plans or in the Specifications, certain equipment or articles or materials may be designated under a trade name of a manufacturer and its catalogue information. The use of alternative equipment or an article or material which is of equal quality and of the required characteristics for the purpose intended will be permitted, subject to the approval of the City Engineer, in accordance with the following requirements:

The burden of proof as to the comparative quality and suitability of alternative equipment or articles or materials must be upon the Contractor, and it must furnish, at its own expense, all information necessary or related thereto as required by the City Engineer. The City Engineer must be the sole judge as to the comparative quality and suitability of alternative equipment or articles or materials, and his/her decision must be final.

The price proposal by the Contractor is assumed to be on the basis of trade names specified or designated in the Specifications. Savings resultant from use of a less expensive equal or alternate must accrue to the City and must be subtracted from the unit price for this item.

6.9 REMOVAL OF EQUIPMENT OR MATERIALS

The Contractor must not sell, assign, mortgage, hypothecate or remove equipment or materials which have been installed or delivered and which may be necessary for the completion of the Contract without the formal consent of the City.

6.10 TESTING OF MATERIALS

Unless otherwise specified elsewhere in the Specifications or in the Special Provisions or called for in the Plans, all tests of materials and work for determining compliance with specified requirements must be performed by the City or its authorized representative.

SECTION 7

LEGAL RELATIONS AND RESPONSIBILITY

7.1 LAWS TO BE OBSERVED

The Contractor must keep itself fully informed of all existing and future State and Federal laws and County and municipal ordinances and regulations which in any manner affect those engaged or employed in the work, or the materials used in the work, or which in any way affect the conduct of the work, and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the same. The contractor must at all times observe and comply with all such existing and future laws, ordinances, regulations, orders, and decrees of bodies or tribunals having any jurisdiction or authority over the work; and must indemnify, defend, and save harmless the City and all its officers, agents and servants against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree, whether by itself or its employees. If any discrepancy or inconsistency is discovered in the Plans, Drawings, Specifications, or Contract for the work in relation to any such law, ordinance, regulation, order or decree, the Contractor must forthwith report the same to the City Engineer in writing.

7.2 PERMITS

The City will obtain all necessary rights and approvals for the work to occupy properties in streets, highways or railways. The Contractor must obtain all permits and pay any fees connected therewith having to do with its construction operations. The Contractor must furnish the City with a copy of all permits and must fully comply with all conditions and provisions of same.

Bidders must contact railway companies affected by the work under the project and ascertain their requirements in respect to indemnification agreements, bonds and insurance. Upon award of Contract, the Contractor must immediately again contact the railway company and, if required, enter into an indemnification agreement, and furnish bonds and insurance, and pay the fees therefor.

All expenses incurred by the railway company as a result of the Contractor's operations must be borne by the Contractor.

7.3 PATENT CLAIMS

The bidder must include in the price proposal for the work the patent fees or royalties or charges upon any patented article or process which it may furnish or use in the prosecution of the work, and the bidder to whom the Contract is awarded must indemnify, defend and save harmless the City against any legal action that may be brought for infringement of patents upon any articles or processes that may be used by it in the prosecution of the work. The contractor must furnish satisfactory evidence of release of all claims of this nature before the final payment is made upon the Contract.

7.4 SANITARY PROVISIONS

The Contractor must provide and maintain in a neat and sanitary condition such accommodations for the use of its employees as may be necessary to comply with all applicable laws, ordinances and regulations pertaining to the public health and sanitation of dwellings and camps. Enclosed toilets must be provided for the use of the persons employed or engaged on any work under these Specifications.

7.5 RIGHT OF WAY AND RIGHT OF ACCESS

The City will acquire all permanent rights of way or permanent easements required for the constructed project. The Contractor is hereby empowered to use the site for the purposes described in the Specifications.

The responsibility for obtaining the right to enter, remove, alter, or make use of any existing road, culvert, bridge, canal, pipeline, levee, fence or similar barrier, lines of communications or improvement of any nature, or the trespassing on privately owned lands, must be in the hands of the Contractor, and it must indemnify, defend and save harmless the City from any and all claims for such damages occasioned by such entering, removing, altering, using or trespassing.

In case of interference to the work by delay of the City in furnishing permanent rights of way or permanent easements, the Contractor will be allowed an extension of time equivalent to the time lost by unavoidable delay in the completion of the Contract because of the failure to furnish the rights of way on time, but no damages will be allowed or paid for such delay.

Rights of way and/or easements and construction easements have been secured for work sites, and for trails and roadways as considered necessary for ingress and egress to the work site. Such rights and/or easements have been delineated on the Plans. The right to enter, remove, alter, or otherwise make use of adjacent property, roads, utility lines, fences, vegetation and other improvements as not included within the rights of way or easements must be at the sole expense and responsibility of the Contractor.

7.6 PUBLIC CONVENIENCE AND ACCESS

The Contractor must conduct its operations so as to cause the minimum obstruction and inconvenience to traffic and to places of business and residence adjacent to the work. No greater quantity of work must be under construction at any one time than can be properly conducted with due regard for the rights of the public. Where existing streets are not available as detours, all traffic must be permitted to pass through the work with as little inconvenience and delay as possible, unless otherwise provided or authorized. If half the street only is under improvement, the other half must be conditioned and maintained as a detour.

The work must be conducted by tunneling, backfilling or bridging where necessary to provide access to fire hydrants and water gates; driveways to service stations, markets or other places of business requiring public vehicular access; and driveways to private residences, unless the Contractor makes other arrangements satisfactory to the City. Temporary approaches to intersecting streets and alleys must be provided and maintained in good condition. Safe crossings for pedestrians must be provided at intervals of not more than 300 feet.

7.7 STORAGE OF MATERIALS IN PUBLIC STREETS, ROADS OR HIGHWAYS

Construction materials must not be stored in streets unless permitted by the City Engineer.

7.8 PUBLIC SAFETY

Attention is called to the “Construction Safety Order,” “Trench Construction Safety Orders,” “General Safety Orders,” and “Tunnel Safety Rules” of the California Division of Occupational Safety and Health to which the Contractor is required by law to conform. The contractor must provide itself with copies of these rules and orders and must keep a copy of each at the site of its operations and must be governed by the requirements thereof. The requirements concerning Ventilation, General Safety Precautions, Transportation, Roof Inspection, Timbering, and all

rules and regulation concerning the use of explosives are of particular importance.

7.9 STREET CLOSURES, DETOURS, BARRICADES

In addition to the requirements of this paragraph and Section 4 of these Specifications, the Contractor must, unless otherwise permitted by the City Engineer, conform to the requirements for street closures, detours and barricades as stipulated in the Special Provisions. However, the City Engineer may permit deviations from the requirements stipulated therein when such deviations are to the best interests of the City and are approved by the County, City or State authorities concerned.

During the progress of the work, adequate provisions must be made by the Contractor to accommodate the normal traffic along streets and highways immediately adjacent to or crossing the work so as to cause a minimum of inconvenience to the general public.

The Contractor must give due notice to local police and fire departments prior to beginning construction and must cooperate with said departments in complying with their requirements pertaining to emergency vehicles and equipment.

The Contractor must comply with the requirements of the County, City or State authorities concerned in regard to their requirements for closure of streets; the providing of barriers, guards, lights, temporary bridges, flagmen and watchmen; and the posting of proper notices or signals to the public regarding detours and the condition of the work under construction so as to effectively guard the public from danger as a result of the work being done under the Contract. The Contractor must fully comply with such requirements. The Contractor must also be held responsible for compliance with any additional requirements as may arise during the progress of the work. All costs involved in respect to the above requirements will be considered as included in the prices proposal for the various items of work.

The Contractor must furnish, install, and upon completion of the work, remove all signs and warning devices required for directing and protecting the public during construction.

The signs and posting thereof must conform to the current requirements as specified in the manuals covering signs published by the Division of Highways, Department of Public Works of the State of California. Copies of these manuals are on file in the office of the Engineer.

The Contractor must notify the appropriate authorities of any municipality or unincorporated area 24 hours in advance of the start of any construction work being done in said municipality or area.

The provisions of Paragraph 7.18, "Emergencies and Responsibility for Damage," must apply to the precautions and safeguards taken by the Contractor in connection with the closure of streets, barricades, detours, signs, etc., as required by the above authorities.

7.10 USE OF EXPLOSIVES

The use of explosives will not be permitted unless otherwise stated in the Special Provisions. If permitted, the method employed and the quantity of explosives used must at all times be subject to the approval of the Engineer. Explosives must be handled, used and stored in accordance with the provisions and requirements of all applicable laws, ordinances and regulations with respect thereto.

The approval by the Engineer for the use of explosives must not relieve the Contractor from its responsibility to indemnify, defend and save harmless the City from any legal actions or claims brought against it because of or on account of the use of explosives.

7.11 PRESERVATION OF PROPERTY

The Contractor must be held responsible for the protection of the restoration of, or the replacement of, any improvements such as, but not limited to, lawns, trees, shrubs, hedges, fences, walls, sidewalks, driveways, curbs, gutters and pavement existing on public or private property at the start of work or placed there during the progress of work and not being specified or shown on the drawings to be either temporarily or permanently removed. The Contractor must be held responsible for the removal of all USA Markings created within the project limits, and in relation to the project. Replacement or restoration must meet the approval of the Engineer.

With respect to trees, the Contractor must obtain permission from the Engineer and from the jurisdictional agency concerned prior to the removal or trimming of any trees, except where a tree is specifically indicated on the Plans or in the Specifications to be removed. Trees which are so indicated need not be replaced except where otherwise stipulated in the Specifications.

All costs involved in the protection and restoration of existing improvements as herein specified must be included in the prices proposal for the various items of work.

7.12 PRESERVATION OF MONUMENTS

The Contractor must not disturb any monuments or stakes found on the line of improvements without permission from the Engineer, and must bear the expenses of resetting any monuments or stakes which may have been disturbed with such permission. The Contractor must reset all street signs and traffic signs disturbed by it during the progress of the work.

7.13 SAFEGUARDING EXCAVATIONS AND STRUCTURES

In making excavations for the project, the Contractor must be fully responsible for providing and installing adequate sheeting and/or timbering and bracing as may be necessary as a precaution against slides or cave-ins, and to protect all existing improvements of any kind, either on public or private property, full from damage. The Contractor must make necessary repairs to or reconstruction of any such improvements damaged at its own expense and as directed by the Engineer.

The Contractor must remove all shattered rock or other loose material which appears dangerous to workmen or to structures. The fact that such removal may enlarge the excavation beyond the required limits must not operate to relieve the Contractor from the necessity of making such removal, and the Contractor must be entitled to no additional compensation under any Contract item on account of such removal and enlargement.

All material required for sheeting, bracing and shoring must be furnished by the Contractor and upon completion of the work, except for such as may be left in place, must become the property of the Contractor.

7.14 EMERGENCIES AND RESPONSIBILITY FOR DAMAGE

The Contractor, at all times throughout the performance of the Contract, must take all precautions necessary to effectually prevent any accident or other cause of damage to life or property in any place affected by the operations in consequence of work being done under the Contract and in consequence of any unusual conditions which may arise, and must to this end erect and maintain suitable and sufficient barriers, signs, lights, or other necessary protection. This requirement must also apply to interruption or contamination of public water supply, irrigation, or other public services, or from the failure of partly completed works.

If, in the opinion of the Engineer, the precautions taken by the Contractor are not safe or adequate at any time during the life of the Contract, he/she may order the Contractor to take further precautions, and if the Contractor must fail so to do, the Engineer may order the work done by the City forces and charge the Contractor for the cost thereof, such cost to be deducted from any moneys due or becoming due the Contractor. Failure of the Engineer to order such additional precautions, however, must not relieve the Contractor from its full responsibility for public safety.

The Contractor must indemnify, defend and save harmless the City from any legal actions or claims of every name and description brought against it for, or on account of, any injury or damage to person or property received or sustained by any person or persons by or from the Contractor, or any duly authorized Subcontractor or any agent, employee or workman, by or on account of work done under the Contract of any extension or addition thereof caused by its negligence, or by or in consequence of any negligence in guarding the same, or any material used or to be used for the same, or by or on account of any material, implement, appliance or machine used in the construction, or by or on account of any accident or of any act or omission of the Contractor, or of any duly authorized Subcontractor or any agent, employee or workman.

A sufficient amount of the money due the Contractor under the Contract as must be determined to be necessary by the City may be retained until all legal actions or claims for damages as aforesaid have been settled and evidence to that effect has been furnished to the City. This amount may be retained in addition to that provided for in Paragraph 9.5.

All of the above provisions must include suits for loss of business and/or obstruction or inconvenience to business or private property owners.

7.15 DISPOSAL OF MATERIAL OUTSIDE OF CITY'S RIGHT OF WAY

Unless otherwise specified in the Special Provisions, the Contractor must make its own arrangements for disposing of materials outside of City's right of way at its own profit or loss, and it must pay all costs involved therewith.

When any material, including excess or unsuitable excavated earth or other materials are to be disposed of outside of City's right of way, the Contractor must first obtain written permit from the property on whose property the disposal is to be made, and it must file said permit or a certified copy thereof, together with a written release from the property owner, absolving the City from any and all responsibility in connection with disposal of material on said property.

Unless otherwise provided in the Special Provisions, full compensation for all costs involved for disposing of materials, as above specified, must be considered as included in the prices paid for the various Contract items of work, and no additional allowance will be made therefor.

7.16 CONTRACTOR'S RESPONSIBILITY FOR WORK

The submitting of a proposal hereunder must be considered as evidence that the bidder has carefully examined the site of the work with regard to the climatic and physical conditions which will affect construction operations.

The Contractor must, throughout the entire term of the Contract, assume all risks and expense of interference and delay in its operations, and the protection from or the repair of damage to improvements being built by it under the Contract as may be caused by water of whatever quantity from floods, storms, industrial waste, irrigation, underground, or other sources. The Contractor must also assume full responsibility and expense of protecting or removing and returning to the site of

work all equipment or materials under its care endangered by any action of the elements.

Furthermore, the Contractor must indemnify, defend and save harmless the City against all claims or suits for damage arising from his operations in dewatering the work and control or diversion of water.

All works installed by the Contractor in connection with dewatering, control, and diversion of water, but not specified to become a permanent part of the project, must be removed and the site restored, insofar as practical, to original condition at the Contractor's own expense.

7.17 CITY ENGINEER CANNOT WAIVE OBLIGATIONS

It is expressly agreed that neither the City Engineer nor any of his/her agents must have the power to waive any of the obligations of these Specifications for the furnishing by the Contractor of good and suitable material and for performing the work as herein described. Failure or omission on the part of the City Engineer, or any of his/her assistants or agents, to condemn defective or inferior work or materials, must not imply acceptance of the work, nor release of the Contractor from obligations at once to tear out, remove and properly replace the same without compensation, at its own cost and expense at any time, upon the discovery of said defective work and material, prior to the final acceptance of the entire Contract; neither must such failure or omission nor any acceptance by the City or by the City Engineer or any other officer or employee of the City be construed as barring the City at any subsequent time from recovery of damages from the Contractor and its sureties, and of such a sum of money as may be needed to remove and to build anew all portions of the work in which fraud was practiced, or improper work or material hidden.

7.18 RIGHTS IN LAND IMPROVEMENTS

Nothing in these Specifications must be considered as allowing the Contractor to make any arrangements with any person to permit occupancy or use of any land, structure or building within the limits of the Contract for any purpose whatsoever, either with or without compensation, in conflict with any agreement between the City and any owner, former owner, or tenant of such land, structure or building.

7.19 PERSONAL LIABILITY

Neither the City, the City Engineer, nor any of his/her agents or other officer or authorized employee of the City must be personally responsible for any liability arising under the Contract. The Contractor must maintain in full force and effect, during the entire life of the Contract, public liability, property damage and personal injury insurance in amounts not less than specified in the Special Provisions. The Contractor must maintain on file with the City during the entire life of the Contract a memorandum of coverage or other evidence of such insurance, issued by the underwriter. Said insurance referred to must not be cancelled or renewal thereof declined unless notice is mailed to the named insured at least 45 days prior to the effective date or renewal or at least 60 days prior to the effective date of cancellation. In addition, if a public agency is named as an additional insured by way of endorsement or certificate of insurance, notice should be given to said public agency. The Contractor must pay all premiums whether said premiums cover extra work or work under regular contract items.

7.20 REPAIR OF EQUIPMENT

The work of installing, assembling, repairing or reconditioning, or other work of any nature on machinery, equipment, or tools used in or upon the work must be considered a part of the work to

be performed under the Contract, and any laborers, workmen, or mechanics working on such machinery, equipment or tools, unless employed by bonafide commercial repair shops, garages, blacksmith shops, or machine shops, which have been established and operating on a commercial basis for a period of at least two months prior to the award of the Contract, must be subject to all of the requirements relating to labor set forth herein and in these Provisions.

7.21 CONTRACTOR'S LEGAL ADDRESS

The address given in the proposal must be considered the Contractor's legal address, but this may be changed at any time by notice in writing to the City at its office. The delivery to such address, or the depositing in the United States mails in a sealed envelope, postpaid, registered and properly directed to the Contractor's legal address, of any communications must be considered a legal and sufficient service of the same upon the Contractor.

7.22 COOPERATION AND COLLATERAL WORKS

Where two or more contractors are employed in related or adjacent work, each must conduct its operations in such manner as not to cause any unnecessary delay or hindrance to the other. Each contractor must be responsible to the other for all damage to work, to person or property, or for loss caused by failure to finish the work within the specified time for completion.

The Contractor must also coordinate its work and cooperate with contractors or workmen employed by other agencies on or adjacent to the site of the work.

7.23 UTILITIES

Utilities for the purpose of these specifications must be considered as including, but not limited to, pipelines, conduits, transmission lines, and appurtenances of "Public Utilities" (as defined in the Public Utilities Act of the State of California) and those of private industry, businesses, or individuals solely for their own use or for use of their tenants; and storm drains, sanitary sewers, street lighting, and traffic signal systems.

All utility service interrupted or severed by the Contractor's operation must be immediately reinstated by temporary connections, and permanent reconstruction must be made as soon as construction operations permit.

The City has, by a search of known records, endeavored to locate and indicate on the drawings, all utilities which exist within the limits of the work. However, the accuracy or completeness of the utilities indicated on the drawings is not guaranteed. Service connections to adjacent property may or may not be shown on the drawings. It must be the responsibility of the Contractor to determine the exact location of all utilities and their service connections. The Contractor must make its own investigation as to the location and type of existing utilities and their appurtenances and service connections which may be affected by the Contract work and must notify the City as to any utility located by it which has been incorrectly shown or omitted from the drawings.

Work required in connection with utilities because of interference with Contract work will be performed and paid for as specified in the following paragraphs, 7.27.1 through 7.22.8; however, when directed or approved by the City Engineer, changes in line or grade of structure being built may be made in order to avoid utilities. The cost of such changes will be paid for as extra work.

7.23.1 By Other Than the Contractor:

When it is stated in the Special Provisions or indicated on the drawings that a utility is to be

relocated, altered, or reconstructed by other than the Contractor, the City will conduct all negotiations with the owners in respect to such work, and the work will be done at no cost to the Contractor.

7.23.2 By the Contractor Under A Specified Contract Item:

When the bidding schedule contains a separate item covering the relocation, alteration, or reconstruction of a utility by the Contractor, the price proposal for said item must cover all costs involved in such work.

The utility owner's drawings and Special Provisions will give the construction details for the work, and, unless the time at which the work must be done is specified in the Special Provisions, the Contractor must coordinate with the utility owner in respect to when the work is to be done.

7.23.3 By the Contractor But Not Under a Specified Contract Item:

When work on a utility is specified or indicated on the Plans to be done by the Contractor, but is not included as a separate Contract item in the bidding schedule, the City will make all arrangements with owner of the utility in respect to the construction details; however, the Contractor must coordinate with the utility owner as to when the work is to be done. Any costs for such work must be absorbed in the unit prices or included in the lump sum amounts proposal for the various Contract items.

7.23.4 By the Contractor - Service Connections:

The alteration, temporary relocation or reconstruction of service connections to adjacent property must be the responsibility of the Contractor, and the contractor must notify occupants of the affected properties before service is interrupted and make all arrangements with the utility owners regarding requirements of interruption and reconstruction of service connections. The costs for such work on service connections must be absorbed in the unit prices or included in the lump sum amounts proposal for the various Contract items, unless otherwise specified in the Special Provisions. Reconstruction of sanitary sewer house connections must be accomplished in the manner shown on the Plans.

7.23.5 By the Contractor for His Own Convenience:

The temporary relocation or the alteration of any utility desired by the Contractor solely for its own convenience in the performance of the Contract work to a position or condition other than that provided for in the Special Provisions or shown on the Plans must be the Contractor's own responsibility, and the contractor must make all arrangements with the owners of the utility regarding such work. Any cost of such work for the Contractor's own convenience must be absorbed in the unit prices or included in the lump sum amounts proposal for the various Contract items.

7.23.6 By the Contractor or by Others – Unknown Utilities Disclosed during Contract Work:

In the event that a utility is disclosed subsequent to the award of Contract, such utility not being indicated on the drawings, the alteration, relocation, or proper support and protection must be done and paid for as follows:

7.23.6.1 When said utility is found to occupy the space required to be occupied by a part of the permanent works to be constructed under the Contract, or when said utility is more or less parallel with the conduit and, in the case of the pipe conduit, found to be within vertical planes of each side

of the pipe a distance away from the pipe equal to ten inches for pipe 96 inches or less in diameter and equal to twelve inches for pipe greater than 96 inches in diameter or to be within the specified excavation pay lines (when such are specified or shown on the drawings), the City will arrange for the relocation or alteration of said utility or require the Contractor to do same as extra work. However, when said utility is found to cross the excavation laterally, but not to intercept the permanent works to be constructed, then the Contractor will be required to maintain the utility in place at its own expense.

7.23.6.2 When said utility is more or less parallel with and any portion of it does not lie within the vertical planes specified hereinabove (for pipe conduit) or does not lie within the excavation pay lines (when such are specified or shown on the drawings), the Contractor must advise the City thereof, and, in cooperation with the City, provide and place the necessary support for proper protection to insure continuous and safe operation of the utility structure. All costs for such work must be borne by the Contractor, unless it is ascertained by the City that the utility's franchise is such as to require the utility to bear such costs, in which case it must be the responsibility of the Contractor to secure enforcement of said franchise if it so desires.

7.23.7 Responsibility of the Contractor

The Contractor must be held responsible for all costs for the repair of any and all damage to the Contract work or to any utility (whether previously known or disclosed during the work), as may be caused by its operations. Utilities not shown on the drawings to be relocated or altered by others must be maintained in place by the Contractor. Utilities which are relocated by others in order to avoid interference with structures and which cross the project work must be maintained in their relocated positions by the Contractor.

At the completion of the Contract work, the Contractor must leave all utilities and appurtenances in a condition satisfactory to the owners and the City.

7.23.8 Delays Caused by Failure to Relocate Utilities

Where parties other than the Contractor are responsible for the relocation of utilities, in accordance with the provisions of these Plans and Specifications, and a delay in the Contractor's work is caused by the failure on the part of said parties to remove or relocate such utilities in time to prevent such delay. It must be understood that the Contractor must not be entitled, as a result of such delay to its work, to damages or additional payments over and above the Contract price. If delays in the Contractor's work are caused by the reason mentioned hereinabove, the Contractor must be entitled to an extension of time. The length of such extension of time will be determined by the City, with consideration as to the effect of the delay on the project as a whole.

In order to minimize delays to the Contractor caused by the failure of other parties to relocate utilities which interfere with construction works, the Contractor, upon request to the City, may be permitted to temporarily omit the portion of work affected by the utility. The portion thus omitted must be constructed by the Contractor immediately following the relocation of the utility involved. Should the omitted portion of the work consist of concrete pipe, the Contractor may complete said portion by constructing a field joint.

Unless otherwise specified, where sewers, drainage water, gas or any other conduits and related structures and appurtenances which have been abandoned or which are to be abandoned as a result of the construction of this project are found to interfere with construction, the interfering portions must be removed and the remaining exposed portions sealed with either a wall of concrete not less

than six inches thick. All salvable castings or steel parts which interfere with construction must be removed, and the Contractor must contact the owners and, if required, must deliver such materials f.o.b. the owner's trucks at the site of the work; otherwise, such material must become the property of the Contractor and must be disposed of by the contractor away from the site of work.

The cost of all such work must be absorbed in the prices proposal for the various items of work, unless it is ascertained that the franchise of the former owner is such as to require it to bear such costs, in which case it must be the responsibility of the Contractor to secure enforcement of said franchise if it so desires.

SECTION 8

PROSECUTIONS AND PROGRESS

8.1 SUBCONTRACTS

The Contractor may sublet the Contract work only in accordance with the provisions of these Specifications and with the consent of the City. The prime Contractor must be held responsible to see that its subcontractors and material suppliers conform to all the provisions of these Specifications. If the Contractor, after complying with these conditions, must sublet any portion of the proposed work to a Subcontractor, the Contractor under the original Contract must remain directly responsible to the City for all work being performed by it or by any Subcontractor under it, and all obligations imposed upon the Contractor in the original Contract must be equally binding upon any Subcontractor under it. The City will deal directly with and make all payment to the original Contractor. Contractor understands and acknowledges that the Subletting and Subcontracting Fair Practices Act (as set forth in the California Public Contracts Code) applies to the Contract and Contractor Agrees to comply with the terms of said Act.

8.2 ASSIGNMENT

The Contractor must not assign the Contract or sublet it as a whole without the written consent of the City. The Contractor must not assign or permit the assignment of or any lien on any money due or to become due to it hereunder without the proper consent of the City.

8.3 PROGRESS OF THE WORK

Time is of the essence in this Contract. Unless otherwise provided in the Special Provisions, the Contractor must begin work not later than 15 calendar days after the date of the Notice to Proceed, and the contractor must prosecute the work with due diligence so as to complete the work within the time specified in the Special Provisions or within such extension of time as may be granted.

Should the Contractor begin work in advance of receiving notice that the Contract has been approved as above provided, any work performed by it in advance of said date of approval must be considered as having been done by it at its own risk and as a volunteer, unless such Contract is so approved.

8.4 CHARACTER OF WORKMEN

The Contractor must employ none but skilled foremen and workmen upon work requiring special qualifications. When required by the Engineer, the contractor must discharge from the work and must not again employ without the consent of the Engineer any employee who is incompetent, disorderly, abusive, dangerous, insubordinate, or who in any way attempts to interfere with the employees of the City in the inspection and supervision of the work.

Any representative of the Contractor who is proven to have deliberately given false information about the performance of any part of the work must be discharged if so ordered by the City Engineer.

8.5 TEMPORARY SUSPENSION OF WORK

The City Engineer may order the Contractor to suspend work when, in his/her opinion, the conditions are such as to prevent the work being properly carried out. Such conditions may include: war, government regulations, labor disputes, strikes, fire, floods, adverse weather or elements, inability to obtain material, labor or equipment, required extra work, or other specific as may be further described in the Specifications. When delay is caused by such order, an extension of time

may be granted when the conditions, in the opinion of the City Engineer, are such as could not have reasonably been foreseen. It is agreed that under no circumstances must the Contractor be excused from performance or entitled to any extra compensation or reimbursement because of any such suspension.

8.6 TIME OF ESSENCE, LIQUIDATED DAMAGES, EXTENSION OF TIME BY CITY

Time is of the essence, and, in case all the work called for under the Contract in all parts and requirements is not finished or completed by the date set forth in the Special Provisions, it is agreed by the parties to the Contract that circumstances and conditions as reflected by records of the City are such that material damage will be sustained by the City, and that it is and will be impracticable and extremely difficult to ascertain and determine the actual damage which the City will sustain in the event of any by reason of such delay. It is, therefore, expressly agreed that the Contractor will pay to the City the sum stated in Special Provisions per day for each and every calendar days delay in finishing the work beyond the date prescribed; and the Contractor agrees to pay said liquidated damages as herein provided. In case the same are not paid, Contractor agrees that the City may deduct the amount thereof from any monies due or that may become due the Contractor under the Contract.

It is further agreed that in case the work called for under the Contract is not finished and completed in all parts and requirements by the date specified, the City must have the right to extend the time of completion or not, as may be deemed to best serve the interest of the City. If it is decided to increase said time, said City must further have the right to charge to the Contractor, its heirs, assigns or sureties and to deduct from the final payment for the work all or any part, as may be deemed proper, of the actual cost of engineering, inspection, superintendence, and other overhead expenses which are directly chargeable to the Contract and which accrue during the period of such extension, except that cost of final surveys and preparation of final estimate must not be included in such charges.

The time of completion will be extended and the Contractor must not be assessed with liquidated damages during any delay beyond the day named for completion of the work caused by Acts of God or acts of the public enemy, fires, floods, epidemics, quarantine restrictions, strikes, and freight embargoes or delay of subcontractors due to such causes, provided the Contractor must notify the Engineer in writing of such cause or causes of delay within ten (10) days from the beginning of any such delay and includes in each monthly pay request the number of days of such delay which occurred in said pay period. Subject to and until entry of a judgment of a court of competent jurisdiction holding contrary to the decision of the Engineer's ascertainment of the facts of existence of such a cause of delay, the extent of the delay and of what constitutes a reasonable extension of time of completion in consequence thereof must be final and conclusive. Failure to give notice of cause of such time delay and failure of inclusion of the Contractor's request for extension based thereon in the monthly pay request as hereinabove provided will be deemed a waiver of right to extension of time for such cause subject only to impossibility of compromise therewith by the Contractor.

It is agreed that under no circumstances must the Contractor be excused from performance or entitled to any extra compensation or reimbursement because of any delay occasioned by or in any way arising out of any Acts of God or acts of the public enemy, fires, floods, epidemics, quarantine restrictions, strikes, and freight embargoes or delay of subcontractors due to such causes.

8.7 DEFAULT BY CONTRACTOR

If the Contractor fails to begin delivery of material and equipment, to commence the work within the time specified, to maintain the rate of delivery of material, to execute the Work in the manner and at such locations as specified, or fails to maintain the work schedule which will insure the Agency's interest, or, if the Contractor is not carrying out the intent of the Contract, the Agency may serve written notice upon the Contractor and the Surety on its Performance Bond demanding satisfactory compliance with the Contract.

The Contract may be canceled by the City without liability for damage, when in the City's opinion the Contractor is not complying in good faith, has become insolvent, or has assigned or subcontracted any part of the work without the City's consent. In the event of such cancellation, the Contractor will be paid the actual amount due based on Contract unit prices or lump sums proposal and the quantity of the work completed at the time of cancellation, less damages caused to the City by acts of the Contractor. The Contractor, in having tendered a Proposal, must be deemed to have waived any and all claims for damages because of cancellation of Contract for any such reason. If the City declares the Contract canceled for any of the above reasons, written notice to that effect must be served upon the Surety. The Surety must, within 5 days, assume control and perform the work as successor to the Contractor.

If the Surety assumes any part of the work, it must take the Contractor's place in all respects for that part, and must be paid by the City for all work performed by it in accordance with the Contract. If the Surety assumes the entire Contract, all money due the Contractor at the time of its default must be payable to the Surety as the work progresses, subject to the terms of the Contract.

If the Surety does not assume control and perform the work within 5 days after receiving notice of cancellation, or fails to continue to comply, the City may exclude the Surety from the premises. The Agency may then take possession of all material and equipment and complete the work by City forces, by letting the unfinished work to another Contractor, or by a combination of such methods. In any event, the cost of completing the work must be charged against the Contractor and its Surety and may be deducted from any money due or becoming due from the Agency. If the sums due under the Contract are insufficient for completion, the Contractor or Surety must pay to the City within 5 days after the Notice of Completion resolution, all costs in excess of the sums due.

The provisions of this subsection must be in addition to all other rights and remedies available to the City under law.

8.8 WORK AT NIGHT – Not Applicable

8.9 MAXIMUM LENGTH OF OPEN TRENCH

Except by special permission of the Engineer, the maximum length of open trench where prefabricated pipe is used must not be greater than 500 feet, or the distance necessary to accommodate the amount of pipe installed in a single day, whichever is the greater. The distance is the collective length, including excavation, construction, pipe laying, backfilling, and compaction at any one location.

Except by special permission of the Engineer, the maximum length of open trench in any one location where concrete structures are poured in place will be that which is necessary to permit the uninterrupted progress of construction of the concrete structure, with construction pursued as

follows: excavation, setting of reinforcing steel, pouring of floor slab, walls, and cover slab or arch are to follow each other without any one of these operations preceding the next nearest operation by more than 200 feet.

Except by special permission of the Engineer, the maximum length of open trench in any one location where prefabricated concrete box conduit is used will be that which is necessary to permit the uninterrupted progress of construction of the concrete structure with construction pursued as follows: excavation, setting of reinforcing steel, pouring of floor slab, erection of side walls, erection of cover slab, and pouring of filler spaces are to follow each other without any one of these operations preceding the next nearest operation by more than 200 feet.

8.10 LIMITED ACCEPTANCE OF WORK

At any time during the progress of the work, the City may, upon written notice to the Contractor, take over and utilize the whole or part of the work, or appurtenance thereto which has been completed, giving, if desired, permits to utilize the same. Such use by the City must constitute a limited acceptance of that part of the work so taken over and utilized which must relieve the Contractor and its sureties from responsibility for any damage to, or defect in, that part of the work not inherent in its construction which may be caused by the use of such part by the City or by property owners under its permits.

SECTION 9

MEASUREMENT AND PAYMENT

9.1 MEASUREMENT FOR PAYMENT

Measurement and calculations of quantities for payment will be as hereinafter specified for the particular material to be furnished or class of work to be performed, unless otherwise specified in the Special Provisions.

It must be understood that the unit prices or lump sum amounts proposal must include full compensation for furnishing all labor, materials, tools, and equipment and doing all work shown on the Plans or stipulated in the Specifications for that particular item of work, unless otherwise specified in the Special Provisions.

When payment is specified to be made on the basis of weight, the weighing must be done on certified platform scales, and the Contractor must furnish the Engineer with the duplicate Certified Weighmaster's Certificates showing the actual net weights. When weighing is done on certified scales at a mixing plant, duplicate weight delivery tickets will be accepted. One ticket must be furnished to the inspector at the plant and one ticket to the Engineer at the site of work. The City will accept the certificates as evidence of the weight delivered.

9.2 SCOPE OF PAYMENT

The Contractor must accept the compensation as herein provided, in full payment for furnishing all materials, labor, tools, and equipment necessary to the completed work and for performing all work contemplated and embraced under the Contract; also for loss or damage arising from the nature of the work, or from the action of the elements, except as hereinbefore provided or from any unforeseen difficulties which may be encountered during the prosecution of the work until the acceptance by prosecution of the work; also for all expenses incurred in consequence of the suspension or discontinuance of the work as herein specified; and for completing the work according to the Plans and Specifications. Neither the payment of any estimate nor of any retained percentage must relieve the Contractor of any obligation to make good any defective work or material.

9.3 DEDUCTIONS FROM PAYMENTS

The City may, at its option and at any time, retain out of any amounts due the Contractor sums sufficient to cover any unpaid claims, provided that sworn statements of said claims must have been filed with the City.

9.4 SCHEDULE OF VALUES

Prior to the Contractor's application for the first progress payment, Contractor must submit a detailed breakdown of its bid by scheduled Work items and/or activities, including coordination responsibilities and project record document responsibilities. Where more than one subcontractor comprises the work of a work item or activity, the Schedule of Values must show a separate line item for each subcontract. Contractor must furnish such breakdown, of the total Contract Sum, by assigning dollar values (cost estimates) to each applicable Progress Schedule network activity, which cumulative sum equals the total Contract Sum. The format and detail of the breakdown must be as directed by City to facilitate and clarify future progress payments to Contractor for direct Work under Contract Documents. This breakdown must be referred to as the Schedule of Values.

Contractor's overhead, profit, insurance, cost of bonds and/or other financing, as well as "general conditions costs," (e.g., site cleanup and maintenance, temporary roads and access, off site access roads, temporary power and lighting, security and the like), must be prorated through all activities so that the sum of all the Schedule of Values line items equal Contractor's total Contract Sum.

City will review the breakdown in conjunction with the Progress Schedule to ensure that the dollar amounts of this Schedule of Values are, in fact, fair market cost allocations for the Work items listed. Upon favorable review by City, City will accept this Schedule of Values for use. City must be the sole judges of fair market cost allocations.

Any attempt to increase the cost of early activities, i.e., "front loading," will be rejected by City, resulting in a complete reallocation of monies until such "front loading" is corrected. Repeated attempts at "front loading" may result in suspension or termination of the Work or refusal to process progress payments, until such time as the Schedule of Values is acceptable to City.

9.5 PAYMENTS AND MONTHLY ESTIMATES

The City Engineer will, after the award of Contract, establish a monthly payment closure date. This date will be the date which will terminate each working month during the life of the Contract for which a monthly payment is payable. The Contractor will, within 5 days after the established monthly payment closure date of each month during the period in which work is being performed, make and deliver to the City two signed copies of monthly Contract payment applications stating the amount or percentage of work completed according to the Contract, as of the closure date established, estimated on the basis of the unit or lump sum Contract prices. No allowance will be made for materials and equipment not incorporated into the work. The City will independently verify the Contractor's monthly payment application and create a monthly progress payment request. The City's determinations for the amounts or percentages of work completed are final.

Except as otherwise provided in a labor compliance program applicable to the Work or as otherwise required by Owner, concurrently with each Application for Payment, Contractor shall submit to Owner Contractor's and its Subcontractors' certified payroll records required to be maintained pursuant to Labor Code Section 1776 for all labor performed during pay periods ending during the period covered by the Application for Payment

The City will prepare a warrant in an amount sufficient with all previous payments to make the aggregate 95 percent of the amount earned as certified, provided, however, that the City at any time after 50 percent of the work has been completed, if it finds that satisfactory progress is being made, may make any of the remaining partial payments in full, less authorized deductions.

The partial payments made as the work progresses will be payments on account and must in no way be considered as an acceptance of any part of the work or materials of the Contract, nor must they in any way govern the final estimate. Extra work will be paid for as specified in Section 4.3.3. Payments for unit price items will be made upon the basis of the unit prices proposal and the quantities of work done, calculated as hereinafter specified, for each particular item of work. However, where several types of work are included in a unit price item, the City will make partial payment for the portions of such work as are completed at the time of making the monthly estimates. All monies due the Contractor under the Contract will be paid on demand by the City, prepared and approved as required by law, and it is understood that any delay in the preparation, approval and payment of these demands will not constitute a breach of Contract on the part of the City.

Payments for lump sum items will be based upon the lump sum proposal and the City's estimate as

to the percentage of completion.

9.6 PAYMENT FOR EXTRA WORK

Payment for extra work will be made as provided by Section 4.3.3. Where payment is to be made on a force account basis, the Contractor and the City's representative must compare records of extra work performed by the Contractor on a force account basis at the end of each day. Copies of these records will be made in duplicate by the City's representative and must be signed by both the inspector and the Contractor's Representative, one copy being forwarded to the Contractor and one copy to the City. Bills for extra work must be signed by the Contractor and submitted to the City.

Each month the Contractor must include in the monthly payment application an estimate of the amount or cost of extra work performed as included in approved Contract Change Orders. The Contractor must submit, at the same time it returns the signed monthly payment application, a complete itemized statement of claim for all costs of extra work performed. Failure to include such a statement or claim for extra work for the pay period, or failure to deliver a complete statement for extra work in excess of that estimated by the City Engineer, must constitute a waiver on the part of the Contractor to any claim for payment for extra work not therein included.

9.6.1 Method of payment for extra work approved as specified in Section 4 under unit price or lump sum amounts or at stipulated prices must be the same as that for Contract items as set forth in this Section.

9.6.2 Payment for extra work by Contractor's force account must be made in the following manner:

Upon verification by the Engineer of the Contractor's statement for force account work, a claim will be prepared upon the proper claims form for approval of the City Engineer and presentation to the City Manager or Assistant City Manager, for his approval and direction.

9.7 FINAL PAYMENT

Upon completion of the Contract work, the City Engineer will, upon acceptance of the work by the City and 35 days after the date of recordation of the Notice of Completion, present the Contractor's claim for the balance of the total Contract price, less any sums which may lawfully be retained under the Contract.

Unless qualified by the Contractor under the procedure established in Section 9.5 hereof, the final progress payment request of the City Engineer must be taken as conclusive evidence of the amount of work done under the Contract. If the Contractor qualified its acceptance of the final progress payment and the parties fail to agree prior to the termination of the 35-day period after recordation of Notice of Completion, the final payment must not be delayed but must be made in accordance with the City Engineer's determination, subject to further claim of the Contractor and compliance by City with court order.

SECTION 10

CLAIMS BY CONTRACTOR

10.1 OBLIGATION TO FILE CLAIMS FOR DISPUTED WORK

10.1.1 Should it appear to Contractor that the Work to be performed or any of the matters relative to the Contract Documents are not satisfactorily detailed or explained therein, or should any questions arise as to the meaning or intent of the Contract Documents, or should any dispute arise regarding the true value of any work performed, work omitted, extra work that the Contractor may be required to perform, time extensions, payment to the Contractor during performance of this Contract, performance of the Contract, and/or compliance with Contract procedures, or should Contractor otherwise seek extra time or compensation FOR ANY REASON WHATSOEVER, then Contractor shall first follow all other procedures set forth in the Contract Documents and Standard Specifications. If a dispute remains, then Contractor shall give written notice to City that expressly invokes this Section 10. City shall decide the issue in writing within 15 days; and City's written decision shall be final and conclusive. If Contractor disagrees with City's decision, or if Contractor contends that City failed to provide a decision timely, then Contractor's SOLE AND EXCLUSIVE REMEDY is to promptly file a written claim setting forth Contractor's position as required herein.

10.1.2 Contractor shall present as its claims all Subcontractor, sub-Subcontractor and supplier claims of any type, and prove them under the terms of the Contract Documents. City shall not be directly liable to any Subcontractor, any supplier, or any other person or organization, or to any surety for or employee or agent of any of them, for damages or extra costs of any type arising out of or resulting from the Project.

10.2 FORM AND CONTENTS OF CLAIM

10.2.1 Contractor's written claim must be submitted via registered mail or certified mail with return receipt requested and must identify itself as a "Claim" under this Section 10 and must include the following: (i) a narrative of pertinent events; (ii) citation to contract provisions; (iii) theory of entitlement; (iv) complete pricing of all cost impacts; (v) a time impact analysis of all time delays that shows actual time impact on the critical path; (vi) reasonable documentation supporting items (i) through (v); and (vii) a verification under penalty of perjury of the claim's accuracy. The Claim shall be submitted to City within thirty (30) calendar days of receiving City's written decision, or the date Contractor contends such decision was due, shall be priced like a change order, and must be updated monthly as to cost and entitlement if a continuing claim. Routine contract materials, for example, correspondence, RFI, change order requests, or payment requests shall not constitute a Claim. Contractor shall bear all costs incurred in the preparation and submission of a Claim.

10.2.2 Upon receipt of a Claim, City shall conduct a reasonable review of the Claim. Within 45 days, or such extended period as City and Contractor may agree, City shall provide Contractor with a written statement identifying what portion of the claim is disputed and what portion is undisputed.

10.2.3 If City's governing body must approve City's response to the Claim and the governing body has not met within the 45-day (or extended) period, then City shall provide its written statement within three (3) days of the governing body's meeting.

10.2.4 City shall pay the undisputed portions of the Claim within 60 days of the issuance of a written statement identifying an undisputed portion.

10.2.5 Claims must be submitted on or before the day of final payment. Claims not submitted before final payment are deemed waived.

10.2.6 Notwithstanding and pending the resolution of any claim or dispute, Contractor shall diligently prosecute the disputed work to final completion in accordance with City's determination.

10.3 INFORMAL CONFERENCE AFTER CLAIM SUBMISSION

10.3.1 If the Contractor disputes City's response to its Claim, including a failure to respond, it may submit via registered mail or certified mail, return receipt requested, a written demand for an informal conference to meet and confer for settlement of the issues in dispute. City shall schedule such a meet and confer conference within 30 days for settlement of the dispute.

10.3.2 Within ten (10) days of the meet and confer conference City shall provide Contractor with a written statement identifying the portion of the Claim that remains in dispute and the portion that is undisputed.

10.3.3 City shall pay the undisputed portions of the Claim within 60 days of the issuance of a written statement identifying an undisputed portion.

10.4 MEDIATION

10.4.1 If the Contractor disputes City's statement provided under Paragraph 10.3(B) it shall inform City and the parties shall mutually agree to a mediator within 10 business days of the written statement. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator.

10.4.2 Mediation shall be confidential and non-binding. Unless otherwise agreed, by the parties or as provided in this Paragraph 10.4, the mediation shall be pursuant to the construction mediation procedures of JAMS and held at the JAMS office closest to the Project site.

10.4.3 The cost of mediation shall be equally shared by all parties to the mediation. The parties shall, prior to the commencement of mediation upon notice of the other party, exchange relevant, non-privileged project documents in compliance with Code of Civil Procedure Sections 2031.010, et seq. The parties may agree mutually to engage in additional discovery prior to mediation. Should the parties proceed with additional discovery, they shall, unless mutually agreed otherwise, comply with Code of Civil Procedure Sections 2019, et. seq. The mediator will undertake to resolve any discovery disputes relating to the mediation.

10.4.4 For Claims under \$375,000, unless the parties agree otherwise in writing, mediation pursuant to this Paragraph 10.4 shall excuse the mediation obligation under Public Contract Code Section 20104.4(a).

10.4.5 If mediation is unsuccessful, the parts of the Claim remaining in dispute shall be resolved as otherwise provided by the Contract and applicable law.

10.4.6 Following receipt of a Claim, the parties may mutually agree, in writing, to waive the mediation requirements of this Paragraph 10.4 and proceed to the commencement of a civil action.

10.4.7 All statutes of limitation shall be tolled from the date of the demand for mediation until a date two weeks following the mediation's conclusion.

10.5 OTHER MATTERS

10.5.1 The provisions of this Section 10 constitute a non-judicial claim settlement procedure that, pursuant to Government Code Section 930.2, shall constitute a condition precedent to submission of a valid Government Code Claim under the Government Code. Contractor shall bear all costs incurred in the preparation, submission and administration of a claim. Any claims presented in accordance with the Government Code must affirmatively indicate Contractor's prior compliance with the claims procedure herein and the previous dispositions under Paragraphs 10.3 and 10.4 above of the claims asserted. No suit may be brought against City arising out of or in connection with the Project unless and until Contractor presents to City a statutory Government Code Claim, in accordance with Government Code Sections 910, et seq. Pursuant to Government Code Section 930.2, the one-year period in Government Code Section 911.2 shall be reduced to 150 days from either accrual of the cause of action, substantial completion or termination of the contract, whichever occurs first; in all other respects, the Government Code shall apply unchanged.

10.5.2 Failure to submit and administer claims as required in Section 10 shall waive Contractor's right to claim on any specific issues not included in a timely submitted claim. Claim(s) or issue(s) not raised in a timely protest and timely claim submitted under this Section 10 may not be asserted in any subsequent litigation, Government Code Claim, or legal action.

10.5.3 Contractor shall submit Subcontractor claims in the same manner as other Claims. In the event a Subcontractor (on behalf of the Subcontractor or a lower-tier subcontractor) requests Contractor in writing to present a Claim to the City and furnishes reasonable documentation supporting the Claim, Contractor shall, within 45 days of receipt of the written request, notify the Subcontractor in writing as to whether the Contractor presented the claim to City and, if the Contractor did not present the Claim, provide the Subcontractor with a statement of the reasons for not doing so.

10.5.4 All waivers or modifications of this Section 10 may only be made a writing signed by City and Contractor, and approved as to form by legal counsel for both; oral or implied modifications shall be ineffective.

10.5.5 Any failure by City to respond within any time frame contained in Paragraphs 10.2 through 10.5 of this Section shall result in the Claim being deemed rejected in its entirety. No failure to meet a time requirement shall constitute an adverse finding with regards to the merits of the Claim or the responsibility or qualifications of the Contractor.

10.6 COMPLIANCE WITH STATUTORY PROCEDURES

10.6.1 The foregoing provisions of Paragraphs 10.2 through 10.5 are intended to comply with Public Contract Code Section 9204 and, to the extent applicable, Public Contract Code Section 20104, et seq. In the event of any conflict, the applicable Public Contract Code provision will

apply.

PART 4 – TECHNICAL SPECIFICATIONS

REVIEWED FOR CODE COMPLIANCE

11/29/2022

Shums Coda Associates

APPROVED

Development Services

Date: 01/13/2023

Staff: Julia Warthin for Building Official

Remarks: CB22-0033 & CB22-0034 - 1170 GOLF COURSE DR - APPROVED

100% CD PROJECT MANUAL

FOR

HONEYBEE POOL RENOVATION

OWNER

CITY OF ROHNERT PARK
PUBLIC WORKS DEPARTMENT
600 ENTERPRISE DRIVE
ROHNERT PARK, CA 94928

ARCHITECT

PBK
2600 TENTH STREET, SUITE 700
BERKELEY, CA 94710
(510) 450-1999

PROJECT 2010200
FEBRUARY 2022

100% CD PROJECT MANUAL
FOR
HONEYBEE POOL RENOVATION

PROJECT 2010200

FEBRUARY 2022

CITY OF ROHNERT PARK
PUBLIC WORKS DEPARTMENT
600 ENTERPRISE DRIVE
ROHNERT PARK, CA 94928

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LOREN GACHEN C37926 Stamp
ARCHITECT

PBK
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GOKHAN AKALAN S5594 Stamp
STRUCTURAL ENGINEER

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DAN LEWIN C38406 Stamp
CIVIL ENGINEER

Hohbach-Lewin, Inc.
260 Sheridan Avenue, Suite 150
Palo Alto, CA 94306
Phone: (650) 617-5930
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01 74 19	Construction Waste Management and Disposal	14
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**SPECIFICATION GROUP
FACILITY CONSTRUCTION SUBGROUP**

DIVISION 02	EXISTING CONDITIONS	
02 40 00	Demolition	2
02 41 19	Selective Demolition	4

DIVISION 03	CONCRETE	
03 10 00	Concrete Formwork	4
03 20 00	Concrete Reinforcement	2
03 30 00	Cast-In-Place Concrete	7

DIVISION 04	MASONRY	
NOT USED		

DIVISION 05	METALS	
NOT USED		

DIVISION 06	WOOD, PLASTICS, AND COMPOSITES	
06 10 00	Rough Carpentry	5
06 41 16	Plastic-Laminate-Clad Architectural Cabinets	6
06 65 00	Exterior Synthetic Trim	4

DIVISION 07	THERMAL AND MOISTURE PROTECTION	
07 21 16	Blanket Insulation	3
07 25 00	Weather Barriers	3
07 46 46	Fiber Cement Siding System	5
07 52 00	Modified Bituminous Membrane Roofing	8
07 62 00	Sheet Metal Flashing and Trim	4
07 71 23	Manufactured Downspouts	2
07 92 00	Joint Sealants	5

DIVISION 08 OPENINGS

08 11 13	Hollow Metal Doors and Frames	5
08 14 00	Wood Doors	2
08 33 23	Overhead Coiling Door	2
08 71 00	Door Hardware	11

DIVISION 09 FINISHES

09 21 16	Gypsum Board Assemblies	6
09 30 15	Porcelain Tile Wall Finishing	4
09 67 26	Quartz Flooring	5
09 77 33	Fiber Reinforced Plastic Panels	3
09 90 00	Painting	10

DIVISION 10 SPECIALTIES

10 14 00	Signage	3
10 21 20	Solid Color Reinforced Composite Toilet Compartments	4
10 28 13	Toilet Accessories	3
10 51 13	Metal Lockers	3
10 82 00	Grilles and Screens	3

DIVISION 11 EQUIPMENT

11 90 00	Miscellaneous Equipment	1
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DIVISION 12 FURNISHINGS

NOT USED

DIVISION 13 SPECIAL CONSTRUCTION

13 11 00	Swimming Pool General Requirements	11
13 11 02	Swimming Pool Concrete	10
13 11 04	Swimming Pool Ceramic Tile	4
13 11 05	Swimming Pool Plaster	6
13 11 06	Swimming Pool Equipment	3
13 11 07	Swimming Pool Mechanical	10
13 11 08	Swimming Pool Electrical	11

DIVISION 14 CONVEYING EQUIPMENT

NOT USED

DIVISION 15 TO 19 RESERVED

NOT USED

SPECIFICATIONS GROUP
FACILITY SERVICES SUBGROUP

DIVISION 20 RESERVED

NOT USED

DIVISION 21 FIRE SUPPRESSION

NOT USED

DIVISION 22 PLUMBING

22 00 00	Plumbing	17
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DIVISION 23 HEATING, VENTILATING, AND AIR CONDITIONING

23 00 00	Heating, Ventilation & Air Conditioning	14
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DIVISION 24 RESERVED

NOT USED

DIVISION 25 INTEGRATED AUTOMATION

NOT USED

DIVISION 26 ELECTRICAL

26 00 00	Electrical (Provided by Consultant)	
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DIVISION 27 COMMUNICATIONS

NOT USED

DIVISION 28 ELECTRONIC SAFETY AND SECURITY

NOT USED

DIVISION 29 RESERVED

NOT USED

SPECIFICATIONS GROUP
SITE AND INFRASTRUCTURE SUBGROUP

DIVISION 30 RESERVED

NOT USED

DIVISION 31 EARTHWORK

31 11 00	Clearing and Grubbing	1
31 23 33	Trenching and Backfill	6

DIVISION 32 EXTERIOR IMPROVEMENTS

32 05 23	Concrete for Exterior Improvements	8
32 11 00	Base Courses	3
32 13 00	Rigid Paving	8
32 31 13	Chain Link Fences and Gates	4

DIVISION 33 UTILITIES

33 05 16	Utility Structures	3
33 40 00	Storm Drainage Utilities	8

DIVISION 34 TRANSPORTATION

NOT USED

DIVISION 35 WATERWAY AND MARINE CONSTRUCTION

NOT USED

DIVISION 36 TO 39 RESERVED

NOT USED

SPECIFICATIONS GROUP
PROCESS EQUIPMENT SUBGROUP

DIVISION 40 PROCESS INTEGRATION

NOT USED

DIVISION 41 MATERIAL PROCESSING AND HANDLING EQUIPMENT

NOT USED

DIVISION 42 PROCESS HEATING, COOLING, AND DRYING EQUIPMENT

NOT USED

DIVISION 43 PROCESS GAS AND LIQUID HANDLING, PURIFICATION, AND STORAGE

NOT USED

DIVISION 44 POLLUTION CONTROL AND WASTE EQUIPMENT

NOT USED

DIVISION 45 INDUSTRY-SPECIFIC MANUFACTURING EQUIPMENT

NOT USED

DIVISION 46 INDUSTRY-SPECIFIC MANUFACTURING EQUIPMENT

NOT USED

DIVISION 47 INDUSTRY-SPECIFIC MANUFACTURING EQUIPMENT

NOT USED

DIVISION 48 ELECTRICAL POWER GENERATION

NOT USED

DIVISION 49 RESERVED

NOT USED

SECTION 01 11 00

SUMMARY OF WORK

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Work Included.
- B. Work under separate contracts.
- C. Work by Owner.
- D. Owner furnished products.
- E. Contractor use of site and premises.
- F. Work Sequence.
- G. Owner occupancy.
- H. Work restrictions.

1.2 WORK INCLUDED

- A. Work of this Contract comprises general construction including remodeling of Honeybee Pool. Work includes, but is not limited to:
 - 1. Pool refinishing.
 - 2. ADA access to pool lift.
 - 3. Handrail to pool stair.
 - 4. Pool decking replacement exceeding 2% at restrooms at path of travel to restrooms, concession and pool lift area, move ADA lift to other side by the lifeguard stand.
 - 5. Remove existing drinking fountain and install ADA drinking fountain.
 - 6. Sidewalk repairs.
 - 7. Replace perimeter fence and entry gates.
 - 8. Removal of existing wading pool, and replace with concrete pavers.
 - 9. Replace sidings and trims at restrooms and privacy screens.
 - 10. At concession buildings, dry rot repairs and replacement of sheathing and framing, and exterior painting of exterior trims.
 - 11. Women's and men's restrooms ADA improvements including stud walls, gypsum board, floor and wall finishes, toilet partitions, removal and installation of plumbing fixtures, shower pans, folding shower and dressing seats, folding baby changing stations, toilet accessories, replace doors and door frames.
 - 12. Remove existing overhead coiling door and install overhead coiling service counter door, fix counter height to be ADA compliant, sliding window, laminate-clad wood casework, ADA signages, graphics, exhaust fan replacements, and roof repairs, light fixtures, and all mechanical and electrical work affected by the ADA improvement work.
- B. Location: 1170 Golf Course Drive, Rohnert Park, CA 94928 for City of Rohnert Park, Owner.
- C. Construct the work under a single lump sum contract.

1.3 WORK BY OWNER

- A. Items noted "NIC" (Not In Contract) will be furnished and installed by Owner.
- B. Owner will remove and retain possession of the following items prior to start of work:
 - 1. All swimming pool safety ropes.
 - 2. Swimming pool related accessories.
- C. Contractor will remove and Owner will take possession of the following items prior to start of work:
 - 1. All graphic wall signage.
 - 2. Display case bulletin board aluminum frame.
 - 3. Drinking fountain.

1.4 CONTRACTOR USE OF SITE

- A. Contractor shall have complete use of the site throughout the construction period.

1.5 OWNER OCCUPANCY

- A. Partial Owner Occupancy: Owner will occupy the entire site during entire construction period, with the exception of areas under construction.
- B. Owner Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed areas of building, before Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and partial occupancy shall not constitute acceptance of the total Work.
- C. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied before Owner occupancy.
- D. Not applicable.
- E. Before partial Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of building.
- F. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of site.
- G. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage.
- H. Perform the Work so as not to interfere with Owner's day-to-day operations.
- I. Maintain existing exits, unless otherwise indicated.
- J. Provide not less than 72 hours notice to Owner of activities that will affect Owner's operations.

1.6 WORK RESTRICTIONS

- A. On-Site Work Hours: Work shall be generally performed during normal business working hours, Monday through Friday, except as otherwise indicated or required to conform to construction schedule and labor codes.
 - 1. Weekend Hours: Not allowed unless authorized in writing.
 - 2. Early Morning Hours: Not allowed unless authorized in writing.
 - 3. Hours for Utility Shutdowns: Not allowed unless authorized in writing.
 - 4. Hours for Noisy Operations: Not allowed unless authorized in writing.

- B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted to do so and then only after arranging to provide temporary utility services according to requirements indicated.
1. Notify Architect not less than 5 days in advance of proposed utility interruptions. Do not proceed with utility interruptions without Architect's permission.

2. PART 2 PRODUCTS

Not Used

3. PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Schedule of Values.
- B. Application for Payment.
- C. Defect assessment.
- D. Non-payment for rejected work.
- E. Change procedures.
- F. Alternates.
- G. Unit prices.

1.2 SCHEDULE OF VALUES

- A. Submit Schedule of Values for approval in duplicate within fourteen days after receipt of Notice to Proceed.
- B. Format: Submit typed schedule based upon the attached Schedule of Values augmented by the Table of Contents of this Project Manual. Identify each line item with number and title of the major specification Section.
- C. Include in each line item, the amount of Allowances specified in this Section.
- D. Include within each line item, a directly proportional amount of Contractor's overhead and profit.
- E. Revise schedule to list approved Change Orders, on continuation sheet, with each Application For Payment.

1.3 APPLICATIONS FOR PAYMENT

- A. Submit one copy of each application on AIA Form G702 - Application and Certificate for Payment and AIA Form G703 Continuation Sheet via e-mail to the City Project Manager.
- B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.
- C. Payment Application Times: The date for each progress payment is indicated in the General Conditions of the Contract.
- D. Payment Application Periods: The period of construction covered by each application for payment is the period indicated in the General Conditions of the Contract.
- E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents. Architect will return incomplete applications without action.
- F. Waiver of Stop Notices: With each application for payment, submit waivers of stop notices from subcontractors for construction period covered by previous application.
- G. Final Payment: As specified in the General Conditions of the Contract and in Section 01 77 00 - Closeout Procedures.
- H. Refer to the General Conditions of the Contract for additional payment provisions.

1.4 DEFECT ASSESSMENT

- A. Replace the Work, or portions of the Work, not conforming to specified requirements.
- B. If, in the opinion of the Architect, it is not practical to remove and replace the Work, the Architect will direct one of the following remedies:
 - 1. The defective Work may remain, but the listed schedule of value will be adjusted to a new value at the discretion of the Architect.
 - 2. The defective Work will be partially repaired to the instructions and satisfaction of the Architect and the listed schedule of value will be adjusted to reflect a new value at the discretion of the Architect.

1.5 NON-PAYMENT FOR REJECTED WORK

- A. Payment will not be made for any of the following:
 - 1. Products wasted or disposed of in a manner that is not acceptable.
 - 2. Products determined to be unacceptable before or after placement.
 - 3. Products not completely unloaded from the transporting vehicle.
 - 4. Products placed beyond the lines and levels of the required work.
 - 5. Products remaining on hand after completion of the work.
 - 6. Loading, hauling and disposing of rejected products.

1.6 CHANGE PROCEDURES

- A. The Architect will advise of minor changes in the Work not involving an adjustment to Contract Sum/Price or Contract Time as authorized by General Conditions on AIA Form G710 Architect's Supplemental Instructions.
- B. The Architect may issue a Proposal Request which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications. Proposal Requests are for information only and are not to be considered instructions to stop the work or to execute the proposed change. Contractor will prepare and submit a detailed estimate within 14 days.
- C. The Contractor may propose a change by submitting a Change Order Request to the Architect, describing the proposed change and its full effect on the Work. Include a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors.
- D. Stipulated Sum Change Order: Based on Proposal Request and Contractor's fixed price quotation or Contractor's Change Order Request as approved by Architect.
- E. Time and Material/Force Account Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in the General Conditions of the Contract.
- F. Maintain detailed records of work done on Time and Material/Force Account basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work as indicated in the General Conditions of the Contract.
- G. Construction Change Directive: AIA Construction Change Directive G-714 (1987) Architect may issue a directive, signed by the Owner and Architect, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work, and designate method of determining any change in Contract Sum or Contract Time. Promptly execute the change.
- H. Change Order Forms: AIA G701 Change Order.

- I. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the General Conditions of the Contract.
- J. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.
- K. Promptly revise progress schedules to reflect any changes in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change and resubmit.
- L. Promptly enter changes in Project Record Documents.

2. PART 2 PRODUCTS

Not Used

3. PART 3 EXECUTION

Not Used

END OF SECTION

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EXAMPLE

SCHEDULE OF VALUES FORMAT*

Project: Honeybee Pool Renovation
Contractor: _____
Date: _____

Item Description	Amount
1. Mobilization and initial expenses	
2. General Conditions	
Temporary Utilities	
Engineering Layout	
Temporary Construction/Dust Control	
General Clean Up/Trash Removal	
Project Manager/Supervision/Truck	
Rental Equipment	
3. Bonds and Insurance	
4. SITE WORK	
Demolition/Removal	
Site	
Building(s)	
Site Preparation	
General Brush and Tree Clearing	
Earthwork	
Site Improvements	
Termite/Weed Treatment	
AC Paving/Base/Striping	
Concrete Curb/Gutters	
Concrete Retaining Walls	
Concrete Paving	
Concrete Site Stairs	
Masonry Garden Walls	
Chain Link Fences/Gates	
Wrought Iron Fences/Gates	
Irrigation	
Planting	
Site Equipment (misc)	
Site Utilities	
Fire Hydrants	
Fire Lines	
Storm Drainage	
Site Water	
Site Gas	
Site Sewer	
Electrical Site Service/Lighting	

Item Description**Amount**

Off-site Work
AC Paving/Base
Concrete Curb/Gutters
Irrigation
Planting
Fire Hydrants
Fire Lines
Storm Drainage
Site Water
Site Gas
Site Sewer
Street Lights
Other

5. FOUNDATIONS

Wall Foundations
Column Foundations
Special Foundations
Other

6. SUBSTRUCTURE

Slab on Grade
Trenches/pits/bases
Basement Excavation/Walls
Subgrade Moisture Protection
Other

7. SUPERSTRUCTURE

Columns and Beams
Concrete Columns/Beams
Masonry Columns
Steel Columns/Beams
Wood Columns/Beams
Glue Laminated Beams
Structural Walls
Concrete Walls
Masonry Walls
Wood Framed Walls
Floor Construction
Concrete Cast in Place
Steel Deck/Framing
Trusses
Wood Framed Floors
Roof Construction
Concrete Cast in Place
Steel Deck/Framing
Trusses
Wood Framed Roofs
Stairs
Other

Item Description**Amount**

8. EXTERIOR CLOSURE

- Exterior Walls/Soffits
 - Sandblast Concrete Seal/Paint
 - Sandblast Masonry Seal/Paint
 - Glass Block
 - Metal Studs
 - Wood Studs
 - Exterior Plaster
 - Exterior Insulation
- Windows/Frames/Glazing
 - Steel Windows/Glazing
 - Aluminum Windows/Glazing
 - Store Front/Glazing
- Doors
 - Metal Doors/Frames
 - Wood Doors/Frames
 - Aluminum Doors/Frames/Glazing
 - Sectional Doors/Frames
 - Roll Up Doors/Frames
 - Store Front
- Frames
- Hardware
- Insulation
 - Thermal Wall
 - Sound Wall
- Sealants/Caulking
- Other

9. ROOFING

- Roof Coverings and Flashing
 - Built Up Roofing
 - Single Ply
 - Preformed Metal
 - Asphalt Shingle
 - Clay/Concrete Tile
 - Roof Walkway System
- Roof Insulation and Fill
 - Lightweight Concrete
 - Insulating Concrete Fill
 - Rigid Insulation
- Flashing and Trim
- Roof Openings
 - Roof Hatches
 - Smoke Hatches
 - Skylights
 - Skyroofs/Walls
 - Ladders to Roof
- Other

Item Description**Amount**

10. INTERIOR CONSTRUCTION

- Fixed Partitions
 - Metal Studs
 - Wood Studs
 - Gypsum Board
 - Interior Plaster
- Movable Partitions
- Compartments & Cubicles
- Toilet Partitions
- Interior Doors
 - Wood Doors
 - Metal Doors
 - Aluminum Doors
 - Roll Up Doors
 - Special Doors
- Frames
- Interior Finishes
 - Painting
 - Walls
 - Ceiling
 - Vinyl Wall Coverings
 - Ceramic Tile
 - Fiberglass Reinforced Panels
 - Concrete Sealer
 - Vinyl Sheet/Tile
 - Rubber Flooring
 - Carpet
 - Wood Flooring
 - Suspended Acoustical Ceiling System
 - Suspended Gypsum Ceiling System
- Specialties
 - Chalkboard/Markerboard/Tackboards
 - Cabinets
 - Toilet Room Accessories
 - Graphics and Signage
 - Other

11. CONVEYING SYSTEMS

- Elevators
- Moving Stairs and Walks
- Pneumatic Tube Systems
- Lifts, Hoists, and Cranes
 - Wheel Chair Lift
 - Dock Leveler/Bumpers
 - Automotive Hoists (single)
 - Two Post Hoist (twin)
- Other

Item Description**Amount**

12. EQUIPMENT

- Library
 - Book Theft System
 - Fixed Book Shelves
 - Rolling Book Shelves
- Multipurpose/Stage
 - Fireproof Curtain
 - Projection Screen(s)
 - Folding Tables/Benches
- Athletic
 - Steel Athletic Lockers
 - Basketball Backstops
 - Bleachers
 - Pool
- Classroom
 - Window Coverings
 - Book Lockers
- Food Service
 - Kitchen Equipment
 - Walk in Freezer/Refrigerator
- Other

13. MECHANICAL

- Plumbing
 - Supply Service
 - Disposal Service
 - Rainwater Service
 - Gas Service
 - Finish Fixtures
- Fire Protection
 - Sprinklers
 - Fire Extinguishers
- HVAC System
 - Equipment
 - Ductwork/Distribution
 - System Controls
 - Testing and Balancing
- Other

14. ELECTRICAL

- Distribution
- Lighting and Power
- Special Systems
 - Alarm System
 - Communications
 - Emergency System
- Other

Item Description**Amount**

15. SPECIAL CONSTRUCTION

Miscellaneous Special Construction

TOTAL COST

\$ _____

*The above categories may be subdivided and items added if the overall order remains the same and the subtotal cost for each category complies with the format as shown. Items not applicable to a particular job may be deleted from this list. Overhead and profit shall be a combined mark up and added proportionally to each line item.

SECTION 01 25 13

PRODUCT SUBSTITUTION PROCEDURES

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Product options.
- B. Substitution procedures.

1.2 DEFINITIONS

- A. Requests for changes in products, materials, or equipment required by Contract Documents proposed by the Contractor prior to and after award of the Contract are considered requests for substitutions. The following are not considered substitutions:
 - 1. Revisions to Contract Documents requested by the Owner or Architect.
 - 2. Specified options of products, materials, and equipment included in Contract Documents.

1.3 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers with Provision for Substitution: Products of manufacturers named and meeting specifications with substitution of products or manufacturer only when submitted under provisions of this section.
- C. Products Specified by Naming One or More Manufacturers without Provision for Substitution: No substitution allowed.

1.4 LIMITATIONS ON SUBSTITUTIONS SUBMITTED PRIOR TO THE RECEIPT OF BIDS

- A. The Bid shall be based upon the standards of quality established by those items of equipment and/or materials which are specifically identified in the Contract Documents.
- B. The opportunity to request a substitution is not for the convenience of the Bidder to request acceptance of equipment and/or materials which may be more familiar or have a lesser cost.
- C. Architect may consider requests for substitutions of specified equipment and/or materials only when requests are received by Architect prior to the date established for the receipt of bids as stipulated in Document 00 21 13 - Instructions to Bidders.
- D. Consideration by Architect of a substitution request will be made only if request is made in strict conformance with provisions of this section.
- E. Burden of proof of merit of requested substitution is the responsibility of the entity requesting the substitution.
- F. It is the sole responsibility of the entity requesting the substitution to establish proper content of submittal for requests for substitutions. Incomplete submittals will be rejected.
- G. Architect's decision on substitution requests are final and do not require documentation or justification.
- H. When substitution is not accepted, provide specified product.
- I. Substitute products shall not be included within the bid without written acceptance by Addendum.

1.5 LIMITATIONS ON SUBSTITUTIONS SUBMITTED AFTER THE AWARD OF THE CONTRACT

- A. The Contract is based upon the standards of quality established by those items of equipment and/or materials which are specifically identified in the Contract Documents.
- B. The opportunity to request a substitution is not for the convenience of the Contractor to request acceptance of equipment and/or materials which may be more familiar or have a lesser cost.
- C. Consideration by Architect of substitution requests received after the established date of the receipt of bids or contract award will only be made when one or more of the following conditions are met and documented:
 - 1. Specified item fails to comply with regulatory requirements.
 - 2. Specified item has been discontinued.
 - 3. Specified item, through no fault of the Contractor, is unavailable in the time frame required to meet project schedule.
 - 4. Specified item, through subsequent information disclosure, will not perform properly or fit in designated space.
 - 5. Manufacturer declares specified product to be unsuitable for use intended or refuses to warrant installation of product.
 - 6. Substitution would be, in the sole judgement of the Architect, a substantial benefit to the Owner in terms of cost, time, energy conservation, or other consideration of merit.
- D. Notwithstanding the provisions of Article 1.4 of this section and the above, the Architect may consider a substitution request after the date of the receipt of bids or contract award, if in the sole discretion of the Architect, there appears to be just cause for such a request. The acceptance of such a late request does not waive any other requirement as stated herein.
- E. Consideration by Architect of a substitution request will be made only if request is made in strict conformance with provisions of this section.
- F. Substitutions will not be considered when they are indicated or implied on shop drawings or product data submittals without separate written request as required by provisions of this section.
- G. Review of shop drawings does not constitute acceptance of substitutions indicated or implied on shop drawings.
- H. Substitutions will not be considered when requested or submitted directly by subcontractor or supplier.
- I. Substitutions will not be considered as a result of the failure to pursue the work promptly or coordinate activities properly.
- J. Burden of proof of merit of requested substitution is the responsibility of the Contractor.
- K. It is the sole responsibility of the Contractor to establish proper content of submittal for requests for substitutions. Incomplete submittals will be rejected.
- L. Owner shall receive full benefit of any cost reduction as a result of any request for substitution.
- M. Architect's decision on substitution requests is final and does not require documentation or justification.
- N. When substitution is not accepted, provide specified product.
- O. Substitute products shall not be ordered or installed without written acceptance.

1.6 REGULATORY REQUIREMENTS

- A. It shall be the responsibility of the entity requesting the substitution to obtain all regulatory approvals required for proposed substitutions.
- B. All regulatory approvals shall be obtained for proposed substitutions prior to submittal of substitution request to Architect.
- C. All costs incurred by the Owner in obtaining regulatory approvals for proposed substitutions to include the costs of the Architect and any authority having jurisdiction over the project shall be reimbursed to the Owner. Costs of these services shall be reimbursed regardless of final acceptance or rejection of substitution.

1.7 SUBSTITUTION REPRESENTATION

- A. In submitting a request for substitution, the entity requesting the substitution makes the representation that he or she:
 - 1. Has investigated the proposed substitution and has determined that it meets or exceeds the quality level of the specified product.
 - 2. Will provide the same warranty or guarantee for the substitution as for the specified product.
 - 3. Will coordinate installation and make changes to other work which may be required for the work to be completed with no additional cost to the Owner.
 - 4. Waives claims for additional cost or time extension which may subsequently become apparent.
 - 5. Will reimburse Owner for the cost of Architect's review or redesign services associated with substitution request.

1.8 SUBMITTAL PROCEDURE

- A. Submit each Substitution Request in conformance with the requirements of this section.
- B. Assemble complete Substitution Request into a single bookmarked Portable Document Format (PDF) file.
- C. Transit electronic PDF files via Architect's Project Collaboration Site address [or designated email address.
- D. Submit request with Architect's Substitution Request Form. Form may be obtained at the office of the Architect. Substitution requests received without request form will be returned unreviewed.
- E. Limit each request to one proposed substitution.
- F. Request to include sufficient data so that direct comparison of proposed substitution can be made.
- G. Provide complete documentation for each request. Documentation shall include the following information, as appropriate, as a minimum:
 - 1. Statement of cause for substitution request.
 - 2. Identify product by specification section and article number.
 - 3. Provide manufacturer's name, address, and phone number. List fabricators, suppliers, and installers as appropriate.
 - 4. List similar projects where proposed substitution has been used, dates of installation and names of Architect and Owner.
 - 5. List availability of maintenance services and replacement materials.
 - 6. Documented or confirmation of regulatory approval.

7. Product data, including drawings and descriptions of products.
 8. Fabrication and installation procedures.
 9. Samples of proposed substitutions.
 10. Itemized comparison of significant qualities of the proposed substitution with those of the product specified. Significant qualities may include size, weight, durability, performance requirements and visual effects.
 11. Coordination information, including a list of changes or modifications needed to other items of work that will become necessary to accommodate proposed substitution.
 12. Statement on the substitutions effect on the construction schedule.
 13. Cost information including a proposal of the net change, if any, in the Contract sum if the substitution is submitted after the receipt of bids or contract award.
 14. Certification that the substitution is equal to or better in every respect to that required by the Contract Documents and that substitution will perform adequately in the application intended.
 15. Waiver of right to additional payment or time that may subsequently become necessary because of failure of substitution to perform adequately.
- H. Inadequate warranty, vagueness of submittal, failure to meet specified requirements, or submittal of insufficient data will be cause for rejection of substitution request.

1.9 ARCHITECT'S REVIEW

- A. Within 14 days of receipt of request for substitution, the Architect will accept or reject proposed substitution.
- B. If a decision on a substitution cannot be made within the time allocated, the product specified shall be used.
- C. There shall be no claim for additional time for review of proposed substitutions.
- D. Final acceptance of a substitution submitted prior to the date established for the receipt of bids will be in the form of an Addendum.
- E. Final acceptance of a substitution submitted after the award of the contract will be in the form of a Change Order.

2. PART 2 PRODUCTS

Not Used

3. PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Coordination.
- B. Preconstruction conference.
- C. Progress meetings.
- D. Request for Information (RFIs).
- E. Preinstallation conferences.
- F. Closeout conference.
- G. Post construction dedication.

1.2 DEFINITIONS

- A. RFI - Request from Contractor seeking additional information, interpretation or clarification of the Contract Documents.

1.3 COORDINATION

- A. Coordinate scheduling, submittals, and Work of the various Sections of Specifications to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Coordinate construction operations of the different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work.
- C. Prior to commencement of a particular type or kind of work examine relevant information, contract documents and subsequent data issued to the project.
- D. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- E. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- F. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- G. In locations where several elements of mechanical and electrical work must be sequenced and positioned with precision in order to fit into available space, prepare coordination drawings showing the actual conditions required for the installation. Prepare coordination drawings prior to purchasing, fabricating or installing any of the elements required to be coordinated.
- H. Closing up of walls, partitions or furred spaces, backfilling and other covering up operations shall not proceed until all enclosed or covered work and inspections have been completed. Verify before proceeding.
- I. Coordinate completion and clean up of Work of separate sections in preparation for Substantial Completion.

- J. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.
- K. Coordinate all utility company work in accordance with the General Conditions.
- L. Coordinate field engineering with the provisions of Section 01 73 00.

1.4 PRECONSTRUCTION CONFERENCE

- A. Architect will schedule a conference immediately after receipt of fully executed contract documents prior to project mobilization.
- B. Mandatory Attendance: Owner, Owner's Resident Inspector, Owner's Testing Laboratory Representative, Architect, Contractor, Contractor's Project Manager and Contractor's Job Superintendent.
- C. Optional Attendance: Architect's consultants, subcontractors and utility company representatives.
- D. Architect will preside at conference, record minutes and distribute copies.
- E. Agenda:
 - 1. Execution of Owner-Contractor Agreement.
 - 2. Issue Notice to Proceed.
 - 3. Submission of executed bonds and insurance certificates.
 - 4. Distribution of Contract Documents.
 - 5. Federal and State labor law requirements applicable to Contract.
 - 6. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.
 - 7. Designation of responsible personnel representing the parties.
 - 8. Procedures and processing of RFIs, field decisions, submittals, substitutions, applications for payments, proposal requests, Change Orders and Contract closeout procedures.
 - 9. Procedures for testing and inspection.
 - 10. Temporary facilities and controls.
 - 11. Procedures for moisture and mold control.
 - 12. Procedures for disruptions and shutdowns.
 - 13. Scheduling.
 - 14. Critical work sequence and long lead items.
 - 15. Work restrictions and working hours.
 - 16. Progress meetings.
 - 17. Use of site and premises.
 - 18. Storage.
 - 19. Authorities having jurisdiction over project.
 - 20. Owner occupancy requirements.

21. Construction waste management.
22. Preparation of Record Drawings.
23. Security.
24. Parking availability.
25. Progress cleaning.

1.5 PROGRESS MEETINGS

- A. Architect will schedule and administer meetings throughout progress of the Work at maximum weekly intervals.
- B. Architect will make arrangements for meetings, prepare agenda, preside at meetings, record minutes (Field Reports), and distribute copies.
- C. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner, Owner's Inspector, and Architect, as appropriate to agenda topics for each meeting.
- D. Agenda:
 1. Review minutes of previous meetings. (Field Reports)
 2. Review of Work progress.
 3. Field observations, problems, and decisions.
 4. Identification of problems which impede planned progress.
 5. Review of submittals schedule and status of submittals.
 6. Requests For Information (RFIs).
 7. Status of Proposal Requests (PRs).
 8. Status of Change Order Requests (CORs).
 9. Status of Change Orders (Cos).
 10. Status of corrective or deficient items.
 11. Review of off-site fabrication and delivery schedules.
 12. Maintenance of construction schedule.
 13. Corrective measures to regain projected schedules.
 14. Planned progress during succeeding work period.
 15. Coordination of projected progress.
 16. Maintenance of quality and work standards.
 17. Effect of proposed changes on progress schedule and coordination.
 18. Temporary facilities and controls.
 19. Progress cleaning.
 20. Other business relating to Work.

1.6 REQUEST FOR INFORMATION (RFI'S)

- A. Procedure: Immediately on discovery of the need for additional information, interpretation of the Contract Documents, and if not possible to request interpretation at Progress Meeting, prepare and submit an RFI in the form specified.
1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
 3. Each RFI shall address only one subject matter.
- B. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:
1. Date.
 2. Project name.
 3. Owner's name.
 4. Name of Contractor.
 5. Name of Architect.
 6. RFI number, numbered sequentially.
 7. Specification Section number and title and related paragraphs, as appropriate.
 8. Drawing number and detail references, as appropriate.
 9. Field dimensions and conditions, as appropriate.
 10. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 11. Contractor's signature.
 12. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.
- C. Software-Generated RFIs: Software-generated form with substantially the same content as indicated above. Attachments shall be electronic files in a format that will allow electronic editing by the Architect.
- D. Architect's Action: Architect will review each RFI, determine action required, and return it. Allow fifteen days for Architect's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day. If the RFI is required to be forwarded to a consultant, subconsultant, or Owner for a response, the response time will be twenty five days.
1. The following RFIs will be returned without action:
 - (a) Requests for approval of submittals.
 - (b) Requests for approval of substitutions.
 - (c) Requests for information already indicated in the Contract Documents.
 - (d) Requests for coordination information which is the responsibility of the Contractor.
 - (e) Requests for adjustments in the Contract Time or the Contract Sum.

- (f) Requests for interpretation of Architect's actions on submittals and substitutions.
 - (g) Incomplete RFIs or RFIs with numerous errors.
2. Architect's action may include a request for additional information, in which case Architect's allowable time for response will start again.
 3. Architect's review of or response to RFIs shall not constitute an approval, direction, or procedure related to construction means, methods, techniques, sequences, or procedures of Contractor.
 4. Architect's review of or response to RFIs shall not constitute an approval, direction, or procedure related to the construction site safety precautions, procedures or methodology of Contractor.
 5. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Order Request according to Division 01 Section 01 20 00 - Price and Payment Procedures.
 - (a) If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within five days of receipt of the RFI response.
 - (b) Under no circumstances is the Architect's review of or response to RFIs to be considered an authorization to depart from the Contract Documents or an authorization to perform extra work.
- E. On receipt of Architect's action immediately distribute the RFI response to affected parties.
 - F. Review response and notify Architect within three days if Contractor disagrees with response.

1.7 PREINSTALLATION CONFERENCES

- A. When required in individual specification Section, convene a preinstallation conference prior to commencing work of the Section. Refer to individual specification section for timing requirements of conference.
- B. Require attendance of parties directly affecting, or affected by, work of the specific Section.
- C. Notify Architect a minimum of seven days in advance of meeting date.
- D. Preinstallation conference to coincide with regularly scheduled progress meeting.
- E. Prepare agenda, preside at conference, record minutes, and distribute copies within two days after conference to participants.
- F. Agenda:
 1. Review of Contract Documents.
 2. Manufacturer's recommendations.
 3. Status of submittals.
 4. Related RFIs.
 5. Related Change Orders.
 6. Schedule of work activities.
 7. Deliveries of materials and equipment.
 8. Sequence of operation.
 9. Acceptable substrates.
 10. Interface requirements.

11. Possible conflicts.
12. Access.
13. Site utilization.
14. Tests and inspections.
15. Review of Mockups.
16. Temporary facilities and controls.
17. Quality and work standards.
18. Weather limitations.

G. Preinstallation Schedule:

1. Section 01 74 19 - Construction Waste Management and Disposal

1.8 PROJECT CLOSEOUT CONFERENCE

- A. Architect will schedule a project closeout conference, at a time convenient to Owner and Contractor prior to the scheduled date of Substantial Completion.
- B. Mandatory Attendance: Owner, Owner's Resident Inspector, Owner's Testing Laboratory, Architect, and Contractor.
- C. Architect will preside at conference, record minutes, and distribute copies.
- D. Refer to Section 01 77 00 for additional closeout requirements.
- E. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 1. Submittal procedures for closeout documents.
 2. Preparation of Record Documents.
 3. Procedures required prior to review for Substantial Completion and for final review for acceptance.
 4. Procedures for completing and archiving web-based Project software site data files.
 5. Submittal of written warranties.
 6. Requirements for preparing operations and maintenance data.
 7. Requirements for delivery of material samples, attic stock, and spare parts.
 8. Requirements for demonstration and training.
 9. Preparation of Contractor's punch list.
 10. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 11. Coordination of separate contracts.
 12. Owner's partial occupancy requirements.
 13. Installation of Owner's furniture, fixtures, and equipment.
 14. Responsibility for removing temporary facilities and controls.

1.9 POST CONSTRUCTION DEDICATION

A. Attendance Required: Project superintendent, project manager, major subcontractors, Owner and Architect.

B. Preparation prior to Dedication:

1. Assist Owner in operation of mechanical systems.
2. Not applicable.
3. Assist Owner in operation of lighting systems.

2. PART 2 PRODUCTS

Not Used

3. PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 32 16

CONSTRUCTION SCHEDULE - NETWORK ANALYSIS

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. References.
- B. Performance requirements.
- C. Quality assurance.
- D. Qualifications.
- E. Project record documents.
- F. Submittals.
- G. Review and evaluation.
- H. Format.
- I. Cost and schedule reports.
- J. Early work schedule.
- K. Construction schedule.
- L. Short interval schedule.
- M. Requested time adjustment schedule.
- N. Recovery schedule.
- O. Updating schedules.
- P. Distribution.

1.2 REFERENCES

- A. Construction Planning and Scheduling Manual - A Manual for General Contractors and the Construction Industry, The Associated General Contractors of America (AGC).
- B. CSI - Construction Specifications Institute MP-2-1 Master Format.
- C. National Weather Service - Local Climatological Data.

1.3 PERFORMANCE REQUIREMENTS

- A. Ensure adequate scheduling during construction activities so work may be prosecuted in an orderly and expeditious manner within stipulated Contract Time.
- B. Ensure coordination of Contractor and subcontractors at all levels.
- C. Ensure coordination of submittals, fabrication, delivery, erection, installation, and testing of materials and equipment.
- D. Ensure on-time delivery of Owner furnished materials and equipment.
- E. Ensure coordination of jurisdictional reviews.

- F. Assist in preparation and evaluation of applications for payment.
- G. Assist in monitoring progress of work.
- H. Assist in evaluation of proposed changes to Contract Time.
- I. Assist in evaluation of proposed changes to Construction Schedule.
- J. Assist in detection of schedule delays and identification of corrective actions.

1.4 QUALITY ASSURANCE

- A. Perform work in accordance with Construction Planning and Scheduling Manual published by the AGC.
- B. Maintain one copy of document on site.
- C. In the event of discrepancy between the AGC publication and this section, provisions of this section shall govern.

1.5 QUALIFICATIONS

- A. Scheduler: Personnel or specialist consultant with 5 years minimum experience in scheduling construction work of a complexity and size comparable to this Project.
- B. Administrative Personnel: 5 years minimum experience in using and monitoring schedules on comparable projects.

1.6 PROJECT RECORD DOCUMENTS

- A. Submit record documents under provisions of Section 01 77 00.
- B. Submit one electronic file and one hard copy of final Record Construction Schedule which reflects actual construction of this Project.
- C. Record schedule shall be certified for compliance with actual way project was constructed.
- D. Receipt of Record Construction Schedule shall be a condition precedent to any retainage release or final payment.

1.7 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Within 7 days from the Notice of Award submit proposed Early Work Schedule and preliminary Cost Report defining activities for first 60 days of Work.
- C. Within 45 days from Notice of Award submit proposed Construction Schedule and final Cost Report.
- D. Submit updated Construction Schedule at least 10 days prior to each Application for Payment.
- E. Submit Short Interval Schedule at each Construction Progress Meeting.
- F. Submit Time Adjustment Schedule within 10 days of commencement of a claimed delay.
- G. Submit Recovery Schedules as required by completion of work.
- H. Submit one electronic file and three copies of each schedule and cost report.

1.8 REVIEW AND EVALUATION

- A. Early Work Schedule shall be reviewed during Preconstruction Conference with Owner and Architect.
- B. Within 5 days of receipt of Owner and Architect's comments provide satisfactory revision to Early Work Schedule or adequate justification for activities in question.
- C. Acceptance by Owner of corrected Early Work Schedule shall be a condition precedent to making any progress payments for first 60 days of Contract.
- D. Cost loaded values of Early Work Schedule shall be basis for determining progress payments during first 60 days of Contract.
- E. Participate in joint review of Construction Schedule and Reports with Owner and Architect.
- F. Within 7 days of receipt of Owner and Architect's comments provide satisfactory revision to Construction Schedule or adequate justification for activities in question.
- G. In the event that an activity or element of work is not detected by Owner or Architect review, such omission or error shall be corrected by next scheduled update and shall not affect Contract Time.
- H. Acceptance by Owner of corrected Construction Schedule shall be a condition precedent to making any progress payments after first 60 days of Contract.
- I. Cost-loaded values of Construction Schedule shall be basis for determining progress payments.
- J. Review and acceptance by Owner and Architect of Early Work Schedule or Construction Schedule does not constitute responsibility whatsoever for accuracy or feasibility of schedules nor does such acceptance expressly or impliedly warrant, acknowledge or admit reasonableness of activities, logic, duration, manpower, cost or equipment loading stated or implied on schedules.

1.9 FORMAT

- A. Prepare diagrams and supporting mathematical analyses using Precedence Diagramming Method, under concepts and methods outlined in AGC Construction Planning and Scheduling Manual.
- B. Listings: Reading from left to right, in ascending order for each activity.
- C. Diagram Size: 42 inches maximum height x width required.
- D. Scale and Spacing: To allow for legible notations and revisions.
- E. Illustrate order and interdependence of activities and sequence of work.
- F. Illustrate complete sequence of construction by activity.
- G. Provide legend of symbols and abbreviations used.

1.10 COST AND SCHEDULE REPORTS

- A. Activity Analysis: Tabulate each activity of network diagram and identify for each activity:
 - 1. Description.
 - 2. Interface with outside contractors or agencies.
 - 3. Number.
 - 4. Preceding and following number.
 - 5. Duration.

6. Earliest start date.
7. Earliest finish date.
8. Actual start date.
9. Actual finish date.
10. Latest start date.
11. Latest finish date.
12. Total and free float.
13. Identification of critical path activity.
14. Monetary value keyed to Schedule of Values.
15. Manpower requirements.
16. Responsibility.
17. Percentage complete.
18. Variance positive or negative.

B. Cost Report: Tabulate each activity of network diagram and identify for each activity:

1. Description.
2. Number.
3. Total cost.
4. Percentage complete.
5. Value prior to current period.
6. Value this period.
7. Value to date.

C. Required Sorts: List activities in sorts or groups:

1. By activity number.
2. By amount of float time in order of early start.
3. By responsibility in order of earliest start date.
4. In order of latest start dates.
5. In order of latest finish dates.
6. Application for payment sorted by Schedule of Values.
7. Listing of activities on critical path.
8. Listing of basic input data which generates schedule.

1.11 EARLY WORK SCHEDULE

- A. Shall establish scope of work to be performed during first 60 days of Contract.
- B. Shall designate critical path or paths.
- C. Shall contain the following phases and activities:
 - 1. Procurement activities to include mobilization, shop drawings and sample submittals.
 - 2. Identification of key and long-lead elements and realistic delivery dates.
 - 3. Construction activities in units of whole days limited to 14 days for each activity except non-construction activities for procurement and delivery.
 - 4. Approximate cost and duration of each activity.
- D. Shall contain seasonal weather considerations. Seasonal rainfall shall be 10 year average for the month as evidenced by Local Climatological Data obtained from U.S. National Weather Service.
- E. Activities shall be incorporated into Construction Schedule.
- F. No application for payment will be evaluated or processed until Early Work Schedule has been submitted and reviewed.
- G. Shall be updated on a monthly basis while Construction Schedule is being developed.
- H. Failure to submit an adequate or accurate Early Work Schedule or failure to submit on established dates will be considered a substantial breach of Contract.

1.12 CONSTRUCTION SCHEDULE

- A. Include Early Work Schedule as first 60 days of Construction Schedule.
- B. Shall be a computer generated time scaled network diagram of activities.
- C. Indicate a completion date for project that is no later than required completion date subject to any time extensions processed as part of a change order.
- D. Conform to mandatory dates specified in the Contract Documents.
- E. Should schedule indicate a completion date earlier than any required completion date, Owner or Architect shall not be liable for any costs should project be unable to be completed by such date.
- F. Seasonal weather shall be considered in planning and scheduling of all work. Seasonal rainfall shall be 10 year average for the month as evidenced by Local Climatological Data obtained from U.S. National Weather Service.
- G. Level of detail shall correspond to complexity of work involved.
- H. Indicate procurement activities, delivery, and installation of Owner furnished material and equipment.
- I. Designate critical path or paths.
- J. Subcontractor work at all levels shall be included in schedule.
- K. As developed shall show sequence and interdependence of activities required for complete performance of Work.
- L. Shall be logical and show a coordinated plan of Work.
- M. Show order of activities and major points of interface, including specific dates of completion.

- N. Duration of activities shall be coordinated with subcontractors and suppliers and shall be best estimate of time required.
- O. Shall show description, duration and float for each activity.
- P. Failure to include any activity shall not be an excuse for completing all work by required completion date.
- Q. No activity shall have a duration longer than 14 days or a value over \$20,000.00 except non-construction activities for procurement and delivery.
- R. An activity shall meet the following criteria:
 - 1. Any portion or element of work, action, or reaction that is precisely described, readily identifiable, and is a function of a logical sequential process.
 - 2. Descriptions shall be clear and concise. Beginning and end shall be readily verifiable. Starts and finishes shall be scheduled by logical restraints.
 - 3. Responsibility shall be identified with a single performing entity.
 - 4. Additional codes shall identify building, floor, bid item and CSI classification.
 - 5. Assigned dollar value (cost-loading) of each activity shall cumulatively equal total contract amount. Mobilization, bond and insurance costs shall be separate. General requirement costs, overhead, profit, shall be prorated throughout all activities. Activity costs shall correlate with Schedule of Values.
 - 6. Each activity shall have manpower-loading assigned.
 - 7. Major construction equipment shall be assigned to each activity.
 - 8. Activities labeled start, continue or completion are not allowed.
- S. For major equipment and materials show a sequence of activities including:
 - 1. Preparation of shop drawings and sample submissions.
 - 2. Review of shop drawings and samples.
 - 3. Finish and color selection.
 - 4. Fabrication and delivery.
 - 5. Erection or installation.
 - 6. Testing.
- T. Include a minimum of 15 days prior to completion date for punch lists and clean up. No other activities shall be scheduled during this period.

1.13 SHORT INTERVAL SCHEDULE

- A. Shall be fully developed horizontal bar-chart-type schedule directly derived from Construction Schedule.
- B. Prepare schedule on sheet of sufficient width to clearly show data.
- C. Provide continuous heavy vertical line identifying first day of week.
- D. Provide continuous subordinate vertical line identifying each day of week.
- E. Identify activities by same activity number and description as Construction Schedule.
- F. Show each activity in proper sequence.

- G. Indicate graphically sequences necessary for related activities.
- H. Indicate activities completed or in progress for previous 2 week period.
- I. Indicate activities scheduled for succeeding 2 week period.
- J. Further detail may be added if necessary to monitor schedule.

1.14 REQUESTED TIME ADJUSTMENT SCHEDULE

- A. Updated Construction Schedule shall not show a completion date later than the Contract Time, subject to any time extensions processed as part of a Change Order.
- B. If an extension of time is requested, a separate schedule entitled "Requested Time Adjustment Schedule" shall be submitted to Owner and Architect.
- C. Indicate requested adjustments in Contract Time which are due to changes or delays in completion of work.
- D. Extension request shall include forecast of project completion date and actual achievement of any dates listed in Agreement.
- E. To the extent that any requests are pending at time of any Construction Schedule update, Time Adjustment Schedule shall also be updated.
- F. Schedule shall be a time-scaled network analysis.
- G. Accompany schedule with formal written time extension request and detailed impact analysis justifying extension.
- H. Time impact analysis shall demonstrate time impact based upon date of delay, and status of construction at that time and event time computation of all affected activities. Event times shall be those as shown in latest Construction Schedule.
- I. Activity delays shall not automatically constitute an extension of Contract Time.
- J. Failure of subcontractors shall not be justification for an extension of time.
- K. Float is not for the exclusive use or benefit of any single party. Float time shall be apportioned according to needs of project.
- L. Float suppression techniques such as preferential sequencing, special lead/lag logic restraints, extended activity durations, or imposed dates shall be apportioned according to benefit of project.
- M. Extensions will be granted only to extent that time adjustments to activities exceed total positive float of the critical path and extends Contract completion date.
- N. Owner shall not have an obligation to consider any time extension request unless requirements of Contract Documents, and specifically, but not limited to these requirements are complied with.
- O. Owner shall not be responsible or liable for any construction acceleration due to failure of Owner to grant time extensions under Contract Documents should requested adjustments in Contract Time not substantially comply with submission and justification requirements of Contract for time extension requests.
- P. In the event a Requested Time Adjustment Schedule and Time Impact Analysis are not submitted within 10 days after commencement of a delay it is mutually agreed that delay does not require a Contract time extension.

1.15 RECOVERY SCHEDULE

- A. When activities are behind Construction Schedule a supplementary Recovery Schedule shall be submitted.
- B. Form and detail shall be sufficient to explain and display how activities will be rescheduled to regain compliance with Construction Schedule.
- C. Maximum duration shall be one month and shall coincide with payment period.
- D. Ten days prior to expiration of Recovery Schedule verification to determine if activities have regained compliance with Construction Schedule will be made. Based upon this verification the following will occur:
 - 1. Supplemental Recovery Schedule will be submitted to address subsequent payment period.
 - 2. Construction Schedule will be resumed.

1.16 UPDATING SCHEDULES

- A. Review and update schedule at least 10 days prior to submitting an Application for Payment.
- B. Maintain schedule to record actual prosecution and progress.
- C. Approved change orders which affect schedule shall be identified as separate new activities.
- D. Change orders of less than \$20,000.00 value or less than 3 days duration need not be shown unless critical path is affected.
- E. No other revisions shall be made to schedule unless authorized by Owner.
- F. Provide narrative Progress Report at time of schedule update which details the following:
 - 1. Activities or portions of activities completed during previous reporting period.
 - 2. Actual start dates for activities currently in progress.
 - 3. Deviations from critical path in days ahead or behind.
 - 4. List of major construction equipment used during reporting period and any equipment idle.
 - 5. Number of personnel by craft engaged on Work during reporting period.
 - 6. Progress analysis describing problem areas.
 - 7. Current and anticipated delay factors and their impact.
 - 8. Proposed corrective actions and logic revisions for Recovery Schedule.
 - 9. Proposed modifications, additions, deletions and changes in logic of Construction Schedule.
- G. Schedule update will form basis upon which progress payments will be made.
- H. Owner will not be obligated to review or process Application for Payment until schedule and Progress Report have been submitted.

1.17 DISTRIBUTION

- A. Following joint review and acceptance of updated schedules distribute copies to Owner, Architect, and all other concerned parties.
- B. Instruct recipients to promptly report in writing any problem anticipated by projections shown in schedule.

2. PART 2 PRODUCTS

Not Used

3. PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Related submittals.
- B. Architect's digital data files.
- C. Proposed products list.
- D. Processing time.
- E. Submittal review.
- F. Submittal procedures - paper submittals.
- G. Shop drawings - paper submittals.
- H. Submittal procedures - electronic submittals.
- I. Shop drawings - electronic submittals.
- J. Product data.
- K. Samples.
- L. Manufacturers' instructions.
- M. Manufacturers' certificates.
- N. Submittal schedule.

1.2 RELATED SUBMITTALS

- A. Progress Payments: Section 01 20 00 - Price and Payment Procedures.
- B. Schedule of Values: Section 01 20 00 - Price and Payment Procedures.
- C. Substitutions: Section 01 25 13 – Product Substitution Procedures.
- D. Coordination Drawings: Section 01 31 00 - Project Management and Coordination.
- E. Construction Schedule: Section 01 32 16 - Construction Schedule - Network Analysis.
- F. Tests and Inspections: Section 01 45 29 – Testing Laboratory Services.
- G. Certified Final Property Survey: Section 01 73 00 – Execution Requirements.
- H. Waste Reduction Progress Reports: Section 01 74 19 - Construction Waste Management and Disposal.
- I. Closeout Procedures: Section 01 77 00 – Closeout Procedures.
- J. The General Conditions set forth additional requirements for submittals.

1.3 ARCHITECT'S DIGITAL DATA FILES

- A. Upon written request, and if asked nicely, the Architect's electronic CAD files will be provided for use in connection with preparation of shop drawings subject to the acceptance of the Architect's standard terms and conditions for electronic file transfer.

1.4 PROPOSED PRODUCTS LIST

- A. Within fourteen days after date of Notice to Proceed, submit complete list of major products proposed for use, with name of manufacturer, trade name, model number, and designated specification section of each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.5 PROCESSING TIME

- A. Time period for review of submittals will commence upon receipt of submittal by Architect.
- B. Initial Review: Allow ten working days for each submittal.
- C. Resubmittal Review: Allow ten working days for each resubmittal.
- D. Sequential Review: Allow fifteen working days for initial and resubmittal review of each submittal where review is required by Architect's consultant's, Owner or other parties indicated.

1.6 SUBMITTAL REVIEW

- A. The Architect's review is only for general conformance with design concept and Contract requirements. Contractor is responsible for compliance with Contract Documents, dimensions, quantities, fit and coordination with other Work. Review does not authorize substitutions, exclusions and limitations to Contract requirements unless specifically requested by Contractor and acknowledged by Architect.
- B. Definitions for submittal review:
 - 1. Review Completed - Do Not Resubmit: The Work covered by the submittal has been reviewed by the Architect and may proceed provided it complies with the Contract Documents. Final acceptance will depend on that compliance.
 - 2. Revise as Noted - Do Not Resubmit: The Work covered by the submittal has been reviewed by the Architect and may proceed provided it complies both with Architect's notations and corrections on the submittal and the Contract Documents. Final acceptance will depend on that compliance.
 - 3. Revise as Noted - Resubmit for Record: The Work covered by the submittal has been reviewed by the Architect and the submittal is to be revised according to the Architect's notations and corrections and a new submittal is to be made. Do not proceed with the Work covered by the submittal. Once the revised submittal is received it will be reviewed again by the Architect and retained as the record submittal. Once reviewed, the Work may proceed provided it complies with the Contract Documents. Final acceptance will depend on that compliance.
 - 4. Not Acceptable - Make New Submittal: Do not proceed with the Work covered by the submittal. Prepare a new submittal that complies with the Contract Documents. Once the revised submittal is received it will be reviewed again by the Architect. Once reviewed, the Work may proceed provided it complies with the Contract Documents. Final acceptance will depend on that compliance.
 - 5. Comment Box / Line: This line is for the Architect to take other action as may be appropriate for the actual submittal made. Notations may include a request for additional items or a statement regarding the submittal. This area can also be used in conjunction with other boxes that have been marked.

1.7 SUBMITTAL PROCEDURES - PAPER SUBMITTALS

- A. Transmit each submittal in conformance with requirements of this section.
- B. Sequentially number the transmittal forms. Resubmittals to have original number with an alphanumeric suffix.
- C. Identify Project and Architect's project number, Contractor, Subcontractor or supplier; pertinent Drawing and detail number(s), and specification Section number, as appropriate.
- D. Apply Contractor's stamp, signed or initialed certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents. Submittals without Contractor's stamp and signature will be returned without review.
- E. Schedule submittals to expedite the Project, and deliver to Architect at 2600 Tenth Street, Suite 700, Berkeley, CA 94710, (510) 450-1999. Coordinate submission of related items.
- F. Make submittals in groups containing associated and related items to make sure that information is available for checking each item when it is received.
- G. Submittals for all items requiring color selection must be received before any will be selected.
- H. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.
- I. Make submittals in advance of scheduled dates for installation to allow specified time for review, revisions, and resubmission prior to final review and subsequent placement of orders.
- J. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to permit proper processing.
- K. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.
- L. Provide space for Contractor and Architect review stamps.
- M. Revise and resubmit submittals as required, identify all changes made since previous submittal.
- N. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.
- O. Partial submittals will be considered non responsive and will be returned without review.
- P. Submittals not requested will not be recognized or processed. Submittals not requested will be returned without review.
- Q. Architect will not review submittals that contain material safety data sheets (MSDS) and will return them for resubmittal.
- R. Substitutions will not be considered when they are indicated or implied on submittals without separate written request as required by provisions of Section 01 25 13 - Product Substitution Procedures.

1.8 SHOP DRAWINGS - PAPER SUBMITTALS

- A. Submit six prints of each drawing. Four copies will be retained by Architect.
- B. Review comments will be shown on returned print. Contractor will make and distribute copies as required for his purpose.
- C. After review, distribute in accordance with article on procedures stated above and provide copies for Record Documents described in Section 01 77 00 - Closeout Procedures.

- D. Do not reproduce Contract Documents or copy standard information and submit as shop drawings.
- E. Standard information prepared without specific reference to project requirements will not be considered a shop drawing.
- F. Do not use or allow others to use shop drawings which have been submitted and have been rejected.

1.9 SUBMITTAL PROCEDURES - ELECTRONIC SUBMITTALS

- A. Transmit each electronic submittal in conformance with requirements of this section.
- B. Submittals for all items requiring color selections will not be accepted as an electronic submittal.
- C. Assemble complete submittal package into a single indexed Portable Document Format (PDF) file. File format licensed by Adobe Systems.
- D. Transmit electronic submittals as PDF files via Architect's Project Collaboration Site address or designated email address.
- E. Transmittal form for submittals shall be an electronic form acceptable to the Architect which identifies the Project, the Architect's project number, the Contractor, the Subcontractor or material supplier; pertinent Drawing and detail number(s), and specification Sections, as appropriate.
- F. Provide links enabling navigation to each item of submittal package.
- G. Name electronic submittal file with consistent project identifier composed of Architect's project number, Architect's alpha numeric file designation, and specification section number followed by sequential number. (e.g., 1930700-56-SUB - 064116-01.pdf)
- H. Resubmittals shall include an alphabetic suffix after initial point number. (e.g., 1930700-56-SUB – 064116-01-A.pdf)
- I. Resubmittals shall identify all changes made since previous submittal.
- J. Insert Contractor's review stamp to permanently record Contractor's action.
- K. Contractor's stamp shall be signed or initialed certifying that review, verification of Products required, field dimensions, adjacent work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.
- L. Submittals without Contractor's stamp and signature will be returned without review.
- M. Provide space for Architect's electronic review stamp.
- N. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.
- O. Make submittals in advance of scheduled dates for installation to allow specified time for review, revisions, and resubmission prior to final review and subsequent placement of orders.
- P. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to permit proper processing.
- Q. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.
- R. Contractor shall reproduce and distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.
- S. Partial submittals will be considered non responsive and will be returned without review.

- T. Submittals not requested will not be recognized or processed. Submittals not requested will be returned without review.
- U. Architect will not review submittals that contain material data safety sheets (MSDS) and will return them for resubmittal.
- V. Substitutions will not be considered when they are indicated or implied on submittals without separate written request as required by provisions of Section 01 25 13 - Product Substitution Procedures.

1.10 SHOP DRAWINGS - ELECTRONIC SUBMITTALS

- A. Submit electronic copy of shop drawings in PDF format as specified in this section.
- B. Review comments will be indicated on reviewed document.
- C. After review, distribute in accordance with article on procedures stated above and provide copies for Record Documents described in Section 01 77 00 - Closeout Procedures.
- D. Do not reproduce Contract Documents or copy standard information and submit as shop drawings.
- E. Standard information prepared without specific reference to project requirements will not be considered a shop drawing.
- F. Do not use or allow others to use shop drawings which have been submitted and have been rejected.

1.11 PRODUCT DATA

- A. When specified in individual specification sections, submit copies of data for each product which Contractor requires.
- B. Submit six copies of product data made in paper format. Four copies will be retained by Architect.
- C. Electronic submittals for product data will comply with Article for electronic submittal procedures stated in this section.
- D. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturer's standard data to provide information unique to this Project.
- E. Manufacturer's standard product data or catalogs that do not indicate materials or products that are specific to project will be returned without review.
- F. After review, distribute in accordance with article on procedures stated above and provide copies for Record Documents described in Section 01 77 00 - Closeout Procedures.

1.12 SAMPLES

- A. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
- B. Include identification on each sample, with full Project information.
- C. Submit the number of samples which Contractor requires, plus two which will be retained by Architect.
- D. Reviewed samples which may be used in the Work are indicated in individual specification Sections.
- E. Submittals for all items requiring color selection must be received before any will be selected.
- F. If a variation in color, pattern, texture or other characteristic is inherent within the material or product submitted, sample shall approximate limits of variation.

1.13 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual specification Sections, submit manufacturer's printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for Product Data.
- B. Identify conflicts between manufacturer's instructions and Contract Documents.

1.14 MANUFACTURER'S CERTIFICATES

- A. When specified in individual specification Sections, submit manufacturer's certificate to Architect for review, in quantities specified for Product Data.
- B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference date, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Architect.

2. PART 2 PRODUCTS

Not Used

3. PART 3 EXECUTION

3.1 SUBMITTAL SCHEDULE

SUBMITTAL SCHEDULE				
SPEC. SECTION	TITLE	*SAMPLE	**CATALOG SHEET	**SHOP DRAWING
06 10 00	Rough Carpentry		6	
06 20 00	Finish Carpentry	2		6
06 41 16	Plastic-Laminate-Clad Architectural Cabinets	2		6
07 21 16	Blanket Insulation		6	
07 42 49	Fiber Cement Cladding System	2	6	6
07 62 00	Sheet Metal Flashing and Trim	2	6	6
07 71 23	Manufactured Gutters and Downspouts	2	6	6
07 92 00	Joint Sealants	2	6	
08 11 13	Hollow Metal Doors and Frames	2	6	6
08 12 13	Hollow Metal Frames		6	6
08 14 00	Wood Doors	2	6	6
08 71 00	Door Hardware		6	6
09 21 16	Gypsum Board Assemblies	1		
09 65 00	Resilient Flooring	2	6	6
09 67 26	Quartz Flooring	2	6	
09 77 33	Fiber Reinforced Plastic Panels	2	6	

SUBMITTAL SCHEDULE				
SPEC. SECTION	TITLE	*SAMPLE	**CATALOG SHEET	**SHOP DRAWING
09 90 00	Painting	2	6	
10 14 00	Signage	2	6	6
10 21 20	Solid Color Reinforced Composite Toilet Compartment	2	6	6
10 28 13	Toilet Accessories		6	
10 82 00	Grilles and Screens	2	6	6
32 13 13	Concrete Paving		6	
32 31 13	Chain Link Fences and Gates	2	6	6

* Samples are required for Architect's "color and material board". To expedite approval, Contractor shall expedite the submittal of these items. Color selections will not be made until all such items are received.

** Number of Catalog Sheets and Shop Drawings are for submittals made in paper form.

END OF SECTION

SECTION 01 35 16

ALTERATION PROJECT PROCEDURES

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Products and installation for altering, patching and extending Work.
- B. Transition and adjustments.
- C. Repair of damaged surfaces, finishes, and cleaning.
- D. Fire prevention.

1.2 DEFINITIONS

- A. Protect and Maintain: To remove deteriorating corrosion, reapply protective coatings, and install protective measures such as temporary guards; to provide the least degree of intervention.
- B. Repair: To stabilize, consolidate, or conserve; to retain existing materials and features while employing as little new material as possible. Repair includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials. Repair also includes limited replacement to match existing, rehabilitation, and reconstruction, with compatible substitute materials for deteriorated or missing parts of features when there are surviving prototypes.
- C. Replace: To duplicate and replace entire features with new material to match existing. Replacement includes the following conditions:
 - 1. Duplication: Includes replacing elements damaged beyond repair or missing. Original material is indicated as the pattern for creating new duplicated elements.
 - 2. Replacement with New Materials: Includes replacement with new material when original material is not available as patterns for creating new duplicated elements.
 - 3. Replacement with Substitute Materials: Includes replacement with compatible substitute materials. Substitute materials are not allowed, unless otherwise indicated.
- D. Remove: To detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- E. Remove and Salvage: To detach items from existing construction and deliver them to Owner.
- F. Remove and Reinstall: To detach items from existing construction, repair and clean them for reuse, and reinstall them where indicated.
- G. Existing to Remain or Retain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed and salvaged, or removed and reinstalled.
- H. Match Existing: Material that matches existing materials, as much as possible, in species, cut, color, grain, and finish.
- I. Refinish: To remove existing finishes to base material and apply new finish to match original.

1.3 SUBMITTALS

- A. If alternate methods and materials to those indicated are proposed for any work, provide written description of proposed methods and comparable products.
- B. Where existing conditions may be misconstrued as damage caused by alteration procedures submit evidence of adjacent construction before work begins.

1.4 QUALITY ASSURANCE

- A. Qualifications: An experienced firm regularly engaged in similar alteration Work specified in this Section.
- B. Lead Paint: Each firm conducting activities that disturb painted surfaces shall be a "Lead-Safe Certified Firm" according to 40CFR 745, Subpart E, and shall use only workers that are trained in lead-safe work practices.
- C. Dust and Noise Control: Provide temporary dust and noise-control partitions when required by alteration operations. Do not block means of egress from occupied spaces.
- D. Debris Hauling: Define hauling routes and provide temporary protective coverings.
- E. Fire-Prevention: Comply with NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations. Prepare a written plan for preventing fires during prosecution of the Work. Indicate placement of fire extinguishers, rag buckets, and other fire-control devices. Coordinate with Owner's fire-protection equipment. Include fire-watch personnel when required by alteration operations.
- F. Safety and Health Standard: Comply with ANSI/ASSE A10.6, Safety and Health Program Requirements for Demolition Operations.

1.5 FIELD CONDITIONS

- A. Survey of Existing Conditions: Record existing conditions that affect the Work by use of preconstruction photographs.
- B. Discrepancies: Notify Architect of discrepancies between existing conditions and Contract Documents before proceeding with the Work.
- C. Owner's Removal: Before beginning alteration Work, verify with Owner that all items of importance to them have been removed.
- D. Size Limitations of Existing Space: Materials, products, and equipment used for performing Work and for transporting debris, materials, and products shall be of sizes that clear surfaces within existing spaces, areas, rooms and openings.

1.6 PEDESTRIAN AND VEHICULAR CIRCULATION

- A. Coordinate alteration Work with circulation paths.
- B. Circulation patterns cannot be closed off entirely and can only be redirected around small areas.
- C. Plan and execute the Work accordingly.

2. PART 2 PRODUCTS

2.1 PRODUCTS FOR PATCHING AND EXTENDING WORK

- A. New Materials: As specified in product Sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspection and testing products where necessary, referring to existing Work as a standard.

3. PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that demolition is complete, and areas are ready for installation of new Work.
- B. Beginning of alteration Work means acceptance of existing conditions.

3.2 FIRE PREVENTION

- A. Comply with NFPA 241 requirements.
- B. Remove and keep area free of combustible rubbish, paper, waste, and chemicals.
- C. Heat-Generating Activities: Comply with the following procedures while performing heat-generating procedures including welding, torch-cutting, soldering, brazing, removing paint by heat, or other procedures with open flames.
 - 1. As far as practical, restrict heat generating activities to area outside the building.
 - 2. Do not perform heat generating activities in or near rooms that contain flammable liquids or explosive vapors.
 - 3. Use fireproof baffles to prevent flames, sparks, hot gases, or other high-temperature materials from reaching surrounding combustible materials.
 - 4. Prevent the spread of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings and roofs.
 - 5. Fire Watch: Before working with heat generating activities, employ personnel to serve as fire watch at each location where such work will be performed. Fire watch procedures shall be implemented according to NFPA 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hot Work and NFPA 241.
 - (a) Prohibit fire watch personnel from other work that would distract them from fire-watch duties.
 - (b) Cease work for heat generating activities whenever fire-watch personnel are not present.
 - (c) Fire-watch personnel shall perform final fire-safety inspection each day beginning no sooner than 30 minutes after conclusion of heat generating activities.
 - (d) Fire-watch personnel shall maintain their duties at each area of heat generating activities until 60 minutes after conclusion of daily work.
 - 6. Fire-Control Devices: Provide and maintain fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids.
 - 7. Fire Sprinklers: Where fire sprinkler protection exists and is functional, maintain it without interruption while operations are being performed. Protect sprinklers from damage by operations. Remove protection when operations are complete.

3.3 PREPARATION

- A. Cut, move, or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion.
- B. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.
- C. Remove debris and abandoned items from area and from concealed spaces.
- D. Prepare surface and remove surface finishes to provide for proper installation of new work and finishes.
- E. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.

3.4 INSTALLATION

- A. Coordinate work of alterations and renovations to expedite completion and to accommodate Owner occupancy.
- B. Remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring products and finishes to original or specified condition.
- C. Refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes.
- D. Install products as specified in individual Sections.

3.5 TRANSITIONS

- A. Where new Work abuts or aligns with existing, perform a smooth and even transition. Patched Work to match existing adjacent Work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new work is not possible, request instructions from Architect.

3.6 ADJUSTMENTS

- A. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
- B. Where a change of plane of 1/8 inch or more occurs, request instructions from Architect.
- C. Trim existing doors as necessary to clear new floor finish. Refinish trim as required.
- D. Fit work at penetrations of surfaces as specified in Section 01 73 29.

3.7 REPAIR OF DAMAGED SURFACES

- A. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
- B. Repair substrate prior to patching finish.

3.8 FINISHES

- A. Finish surfaces as specified in individual Product Sections.
- B. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.9 CLEANING

- A. Match samples of existing materials that have been cleaned and identified for acceptable cleaning levels.
- B. Avoid over cleaning to prevent damage to existing materials.

END OF SECTION

SECTION 01 42 19

REFERENCE STANDARDS

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Definitions.
- B. Specification format and content.
- C. Industry standards.
- D. Codes and standards.
- E. Governing regulations/authorities.

1.2 DEFINITIONS

- A. General: Basic contract definitions are included in the General Conditions.
- B. Regulations: Includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the work.

1.3 SPECIFICATION FORMAT AND CONTENT

- A. Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 50-Division Master Format 2018 numbering system.
- B. The sections are placed in the Project Manual in numeric sequence; however, this sequence is not complete and the Table of Contents of the specifications must be consulted to determine the total listing of sections.
- C. The section title is not intended to limit the meaning or content of the section, nor to be fully descriptive of the requirements specified therein.
- D. The organization of the specifications shall not control the division of the work among subcontractors or establish the extent of work to be performed by any trade.
- E. Specifications use certain conventions regarding style of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are:
 - 1. Language used in Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words that are implied, but not stated, shall be interpolated as the sense requires. Singular words shall be interpreted as plural and plural words interpreted as singular where applicable to maintain the context of the Contract Document indicated.
 - 2. Imperative and streamlined language is generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. Subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted.
 - 3. The words "shall be" are implied wherever a colon (:) is used within a sentence or phrase.

1.4 INDUSTRY STANDARDS

- A. Except where Contract Documents include more stringent requirements, applicable construction industry standards shall apply as if bound into the Contract Documents to the extent referenced. Such standards are made part of Contract Documents by reference.
- B. Conform to reference standard by date of issue current on date for receiving bids except when a specific date is indicated.
- C. Where compliance with 2 or more standards is specified and where standards may establish different or conflicting requirements for quantities or quality levels, the more stringent, higher quality and greater quantity of work shall apply.
- D. The quantity or quality level shown or specified shall be the minimum provided or performed. Indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements.
- E. Each entity engaged in construction of the work is required to be familiar with industry standards applicable to its construction activity.
- F. Copies of applicable standards are not bound with the Contract Documents. Where copies of standards are needed to perform a required activity, Contractor shall obtain copies directly from publication source.
- G. Trade associations names and titles of general standards are frequently abbreviated. Where such abbreviations are used in the Specifications or other Contract Documents, they shall mean the recognized trade association, standards-generating organization, authority having jurisdiction, or other entity applicable to the content of the text provision. Refer to the "Encyclopedia of Associations", published by Gale Research Co., available in most libraries.
- H. Refer to individual specification sections and related drawings for names and abbreviations of trade associations and standards applicable to specific portions of the work. In particular, refer to Division 23 for names and abbreviations applicable to mechanical work, and refer to Division 26 for names and abbreviations applicable to electrical work.
- I. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.5 CODES AND STANDARDS

- A. Latest edition of pertaining ordinances, laws, rules, codes, regulations, standards, and others of public agencies having jurisdiction of the work are intended wherever reference is made in either the singular or plural to Code or Building Code except as otherwise specified, including but not limited to latest edition of those in the following listing.
 - 1. 2019 California Building Standards Administrative Code (CBSAC), California Code of Regulations (CCR), Title 24, Part 1
 - 2. 2019 California Building Code (CBC) California Code of Regulations (CCR) Title 24, Part 2 (2018 International Building Code (IBC) with California amendments)
 - 3. 2019 California Electrical Code (CEC) California Code of Regulations (CCR) Title 24, Part 3 (2017 National Electric Code (NEC) with California amendments)
 - 4. 2019 California Mechanical Code (CMC) California Code of Regulations (CCR) Title 24, Part 4 (2018 Uniform Mechanical Code (UMC) with California amendments)
 - 5. 2019 California Plumbing Code (CPC) California Code of Regulations (CCR) Title 24, Part 5 (2018 Uniform Plumbing Code (UPC) with California amendments)
 - 6. 2019 California Energy Code, California Code of Regulations (CCR) Title 24, Part 6

7. 2019 California Existing Building Code (CEBC) California Code of Regulations (CCR) Title 24, Part 10 (2018) International Existing Building Code (IEBC) with California Amendments)
8. 2010 Americans with Disabilities Act (ADA) Standards for Accessible Design. (ADAS)

1.6 GOVERNING REGULATIONS/AUTHORITIES

- A. Authorities having jurisdiction have been contacted where necessary to obtain information for preparation of Contract Documents. Contact authorities having jurisdiction directly for information having a bearing on the work.
- B. Comply with all federal, state and local laws, ordinances, rules and regulations indicated and which bear on the conduct of the work.

2. PART 2 PRODUCTS

Not Used

3. PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 43 00

QUALITY ASSURANCE

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Interpretation of requirements.
- B. Quality assurance and control of installation.
- C. Tolerances.
- D. Field samples.
- E. Mock-up.
- F. Manufacturers' field services and reports.

1.2 INTERPRETATION OF REQUIREMENTS

- A. If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement.
- B. The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation shall comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits.
- C. Where codes or specified standards indicate higher standards, more stringent tolerances or more precise workmanship than levels shown or specified, comply with most stringent requirements.
- D. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

1.3 QUALITY ASSURANCE/CONTROL OF INSTALLATION

- A. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this project, whose work has resulted in construction with a record of successful in-service performance.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and - control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
- E. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- F. Comply fully with manufacturers' instructions, including each step in sequence.
- G. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- H. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.4 TOLERANCES

- A. Monitor tolerance control of installed products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturer's tolerances. Should manufacturer's tolerance conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

1.5 FIELD SAMPLES

- A. Install field samples at the site as required by individual specifications sections for review.
- B. Acceptable samples represent a quality level for the Work.
- C. Where field sample is specified in individual sections to be removed, clear area after field sample has been reviewed by Architect.

1.6 MANUFACTURERS' FIELD SERVICES AND REPORTS

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance of equipment and other field services as applicable, and to initiate instructions when necessary.
- B. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- C. Submit report in duplicate within 15 days of observation to Architect for review.

2. PART 2 PRODUCTS

Not Used

3. PART 3 EXECUTION

3.1 GENERAL INSTALLATION

- A. Comply with requirements specified in Section 01 73 00.

3.2 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Verify that utility services are available, of the correct characteristics, and in the correct locations.

3.3 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

END OF SECTION

SECTION 01 45 29

TESTING LABORATORY SERVICES

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Selection and payment.
- B. Contractor submittals.
- C. Laboratory responsibilities.
- D. Laboratory reports.
- E. Limits on testing laboratory authority.
- F. Contractor responsibilities.
- G. Schedule of inspections and tests.
- H. Test and inspection form.

1.2 REFERENCES

- A. ASTM C140 - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
- B. ASTM D3740 - Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- C. ASTM E329 - Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction.
- D. CBC - California Building Code, Title 24, Part 2 of the California Code of Regulations (CCR).

1.3 SELECTION AND PAYMENT

- A. Owner will employ and pay for services of an independent testing laboratory to perform specified inspection and testing as specified by Owner's testing laboratory.
- B. Owner will pay cost of testing and inspection except the following for which the Contractor shall reimburse the Owner through deductive change order:
 - 1. Any retesting and sampling required due to failure of original test.
 - 2. Any testing and inspection required to be performed that requires testing laboratory or agency to perform services outside the state of California.
 - 3. Concrete design mix.
 - 4. Additional testing expenses caused by failure of the Contractor to adhere to construction schedule or caused by failure of the Contractor to give proper advanced notice or caused by Contractor delay.
- C. Contractor shall employ and pay for services required to perform specified inspection and testing specified as Contractor responsibility.
- D. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.4 QUALITY ASSURANCE

- A. Comply with requirements of ASTM E329 and ASTM D3740.
- B. Laboratory Staff: Maintain a full time registered engineer on staff to review services.
- C. Testing Equipment: Capable of performing tests required calibrated at reasonable intervals with devices acceptable to the National Bureau of Standards.

1.5 OWNER'S TESTING LABORATORY RESPONSIBILITIES

- A. Test samples of mixes submitted by Inspector.
- B. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
- C. Perform specified inspection, sampling, and testing of products in accordance with specified standards.
- D. Ascertain compliance of materials and mixes with requirements of Contract Documents.
- E. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
- F. Perform additional inspections and tests required by Architect.
- G. Attend preconstruction conferences and progress meetings when requested by Architect.

1.6 LABORATORY REPORTS

- A. After each inspection and test, promptly submit within no more than 14 days of the date of the inspection or test one copy of laboratory report to Architect, Engineer, Owner's Resident Inspector, and to Contractor. Reports of test results of materials and inspections found not to be in compliance with the requirements of the Contract Documents shall be forwarded immediately to the Architect, Engineer, Owner's Resident Inspector, and the Contractor.
- B. Include:
 - 1. Date issued.
 - 2. Project title and number.
 - 3. Name of inspector.
 - 4. Date and time of sampling or inspection.
 - 5. Identification of product and Specifications section.
 - 6. Location in the Project.
 - 7. Type of inspection or test.
 - 8. Date of test.
 - 9. Ambient conditions at time of test or sample-taking.
 - 10. Results of tests and interpretation of test results.
 - 11. Professional opinion as to whether tested work is in conformance with Contract Documents.
 - 12. Recommendations on retesting.
- C. Verification of Test Reports: Each testing agency shall submit to the Architect a verified report in duplicate covering all of the tests which were required to be made by that agency during the progress of the project. Such report shall be furnished each time that work on the project is suspended, covering the tests up to that time and at the completion of the project, covering all tests.

1.7 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the Work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the Work.

1.8 CONTRACTOR RESPONSIBILITIES

- A. Submit proposed mix designs to Architect for review in accordance with Section 03 30 00.
- B. Cooperate with laboratory personnel, and provide access to the Work and to manufacturer's facilities.
- C. Notify Architect, Owner's Resident Inspector and testing laboratory 48 hours prior to expected time for operations requiring inspection and testing services.
 - 1. When tests or inspections cannot be performed after such notice, reimburse Owner for laboratory personnel and travel expenses incurred due to the Contractor's negligence.
 - 2. The Contractor shall notify the Owner's representative a sufficient time in advance of the manufacture of material to be supplied by him under the Contract Documents, which must by terms of the Contract be tested, in order that the Owner may arrange for the testing of same at the source of supply.
 - 3. Any material shipped by the Contractor from the source of supply prior to having satisfactorily passed such testing and inspection or prior to the receipt of notice from said representative that such testing and inspection will not be required shall not be incorporated in the job.
- D. Employ and pay for services of Owner's testing laboratory to perform additional inspections, sampling and testing required when initial tests indicate work does not comply with contract documents.

1.9 SCHEDULE OF INSPECTIONS AND TESTS BY CONTRACTOR

- A. Contractor Responsibility:
 - 1. Statement of Responsibility - 1704.4 Refer to listed special inspections under Article 1.9.
- B. Plumbing:
 - 1. Testing as specified in Division 22 including, but not limited to: Sterilization, soil waste and vent, water piping, source of water, gas piping, downspouts and storm drains.
- D. Heating, Ventilating and Air Conditioning:
 - 1. Testing as specified in Division 21 shall include, but not be limited to: Ductwork tests, cooling tower tests, boiler tests, controls testing, piping tests, water and air systems, and test and balance of heating and air conditioning systems.
- F. Electrical
 - 1. Testing as specified in Division 26 including, but not limited to: Equipment testing, all electrical system operations, grounding system and checking insulation after cable is pulled.

2. PART 2 PRODUCTS

Not Used

3. PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Temporary Utilities: Electricity, lighting, heat, ventilation, telephone service, communication service, water, and sanitary facilities.
- B. Temporary Controls: Barriers, enclosures and fencing. Water, erosion, pollution, noise and fire protection control.
- C. Construction Facilities: Access roads, parking, progress cleaning, project signage, and temporary buildings.

1.2 SUBMITTALS

- A. Moisture-Protection Plan:
 - 1. Submit Moisture - Protection Plan under provisions of Section 01 33 00.
 - 2. Describe procedures and controls for protecting materials and construction from moisture absorption and damage, including delivery, handling, and storage provisions for materials subject to moisture absorption or moisture damage, discarding moisture-damaged materials, protocols for mitigating moisture intrusion into completed Work, and replacing moisture damaged Work.
 - 3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, sawing and grinding, and describe plans for dealing with water and moisture from these operations.
 - 4. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

1.3 TEMPORARY ELECTRICITY

- A. Provide and pay for power service required from Utility source.
- B. Provide power outlets for construction operations, with branch wiring and distribution boxes. Provide flexible power cords as required.
- C. Provide main service disconnect and over current protection at convenient location.
- D. Comply with NECA, NEMA, and UL standards and regulations for temporary electric service.
- E. Permanent convenience receptacles may not be utilized during construction.

1.4 TEMPORARY LIGHTING

- A. Provide and maintain lighting for construction operations, observations, inspections, and traffic conditions.
- B. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
- C. Maintain lighting and provide routine repairs.
- D. Permanent building lighting may not be utilized during construction.

1.5 TEMPORARY HEATING/COOLING

- A. Provide and pay for devices as required to maintain specified thermal conditions for construction operations.
- B. Only electric or indirect fired combustion heaters shall be used. No direct fired space heaters will be allowed.

- C. Heaters will be equipped with controls to automatically turn off heater if airflow is interrupted or internal temperature exceeds design temperature.
- D. Do not use permanent equipment for temporary purposes.
- E. Maintain minimum ambient temperature of 50 degrees F and maximum ambient temperature of 80 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.
- F. Maintain temperature above dew point of enclosed space based upon relative humidity of enclosed area.
- G. Continuously monitor temperature of enclosed space(s) using an electronic monitoring device (s). Place devices in locations that will record average temperature of building(s). Provide print out to Architect upon request.

1.6 TEMPORARY VENTILATION

- A. Ventilate enclosed areas to assist cure of materials and to prevent accumulation of dust, fumes, vapors, or gases.
- B. Do not use permanent equipment for temporary ventilation purposes.
- C. Ventilate enclosed spaces to dissipate humidity. Maintain a maximum relative humidity level of less than 60 percent. Avoid pockets of high humidity.
- D. Continuously monitor humidity of enclosed space(s) using an electronic monitoring device(s). Place devices in locations that will record average humidity of building(s). Provide print out to Architect upon request.

1.7 TEMPORARY HUMIDITY CONTROL

- A. Provide temporary ventilation during construction activities to protect installed construction from adverse effects of high humidity and moisture.
- B. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- C. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- D. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.
- E. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record daily readings over a forty-eight hour period. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.

1.8 Not Applicable.

1.9 ELECTRONIC COMMUNICATION SERVICE

- A. Provide minimum DSL electronic communication service, including electronic mail, in primary field office.

1.10 TEMPORARY WATER SERVICE

- A. Provide, maintain and pay for suitable quality water service required for construction operations. Contractor may obtain water from existing fire hydrant if appropriate clearances are acquired and fees paid.
- B. Extend branch piping with outlets located so water is available by hoses with threaded connections.

1.11 TEMPORARY SANITARY FACILITIES

- A. Provide temporary chemical type toilet facilities and enclosures.
- B. Maintain temporary toilet facilities in a sanitary manner.
- C. Existing facilities shall not be used.
- D. Facilities shall comply with the accessibility requirements of the CBC - California Building Code, (CCR) California Code of Regulations, Title 24, Part 2, Section 11B-201.4.

1.12 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
- C. Provide protection for plant life and trees designated to remain and for soft and hardscape areas adjacent to work, replace damaged materials in kind.
- D. Protect non-owned vehicular traffic, stored materials, site and structures from damage.

1.13 FENCING

- A. Construction: Commercial grade chain link fence.
- B. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks. Post fences and gates with no trespassing signs.

1.14 WATER CONTROL

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- B. Provide water barriers as required to protect site from running water.

1.15 EROSION AND SEDIMENT CONTROL

- A. Conform to Best Management Practices for erosion and sediment control and non-storm water management as defined in Sections 3 and 4 of the Construction Activity Handbook published by the Storm Water Quality Association.
- B. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
- C. Minimize amount of bare soil exposed at one time.
- D. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
- E. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.

1.16 TEMPORARY FIRE PROTECTION

- A. Maintain temporary fire protection facilities of the types needed until permanent facilities are installed.
- B. Comply with NFPA 10 "Standard for Portable Fire Extinguishers" and NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations".
- C. Fire safety during construction shall comply with CFC - California Fire Code (CCR) California Code of Regulations, Title 24, Part 9, Chapter 33.
- D. Store combustible materials in containers in fire-safe locations.

- E. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes.
- F. Provide supervision of welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
- G. Refer to Section 01 35 16 Alteration Project Procedures for additional requirements for operations in existing buildings.

1.17 NOISE CONTROL

- A. Provide methods, means, and facilities to minimize noise produced by construction operations.

1.18 POLLUTION CONTROL

- A. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.
- B. Conform to Best Management Practices for waste management and material controls as defined in Section 4 of the Construction Activity Handbook published by the Storm Water Quality Association

1.19 EXTERIOR ENCLOSURES

- A. Provide temporary weather-tight closure of exterior openings to accommodate acceptable working conditions and protection for materials, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification Sections, and to prevent entry of unauthorized persons.
- B. Provide access doors with self-closing hardware and locks.

1.20 INTERIOR ENCLOSURES

- A. Provide temporary partitions and ceilings as required to separate work areas from Owner occupied areas, to prevent penetration of dust and moisture into Owner occupied areas, and to prevent damage to existing materials and equipment.

1.21 SECURITY

- A. Provide security and facilities to protect Work and existing facilities and Owner's operations from unauthorized entry, vandalism, or theft.

1.22 ACCESS ROADS

- A. Construct and maintain temporary roads accessing public thoroughfares to serve construction area. Extend and relocate as Work progress requires. Provide detours necessary for unimpeded traffic flow.
- B. Stabilize temporary vehicle transportation routes and construction entrances to prevent erosion and control dust immediately after grading in accordance with best management practice techniques defined in Section 3 of the Construction Activity Handbook published by the Storm Water Quality Association.
- C. Maintain stabilization techniques as work progresses.
- D. Provide and maintain access to fire hydrants, free of obstructions.
- E. Designated existing on-site roads may be used for construction traffic.

1.23 PARKING

- A. Arrange for temporary surface parking areas to accommodate construction personnel.
- B. Existing on-site parking areas may be used for construction personnel.
- C. Do not allow vehicle parking on existing pavement.

1.24 TRAFFIC CONTROL

- A. Comply with requirements of authorities having jurisdiction.
- B. Obtain all permits, provide all materials and maintain controls as required of authorities having jurisdiction.
- C. Maintain access for fire-fighting equipment and access to hydrants.

1.25 PROGRESS CLEANING

- A. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- B. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- C. Provide walk-off mats at each building entry.

1.26 WASTE DISPOSAL

- A. Waste Management: In compliance with Section 01 74 19 - Construction Waste Management and Disposal.
- B. Maintain building areas free of waste materials, debris, and rubbish.
- C. Remove waste materials, debris, and rubbish from site periodically and legally dispose of off site.
- D. Maintain site area in a clean and orderly condition.

1.27 Not Applicable.

1.28 STORAGE AREAS AND SHEDS

- A. Size to storage requirements for products of individual Sections. Allow for access and orderly provision for maintenance and for inspection of products.

1.29 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Maintain temporary equipment, facilities and controls until Substantial Completion or when use is no longer required.
- B. Remove temporary above grade or buried utilities, equipment, facilities, materials, prior to Substantial Completion review.
- C. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.
- D. Clean and repair damage caused by installation or use of temporary work.
- E. Materials and facilities that constitute temporary facilities are property of the Contractor.

- F. Restore existing facilities used during construction to original condition.
- G. Restore permanent facilities used during construction to specified condition.
- H. Replace construction that cannot be satisfactorily restored.

2. PART 2 PRODUCTS

Not Used

3. PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 61 00

PRODUCT REQUIREMENTS

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Products.
- B. Transportation and handling.
- C. Storage and protection.
- D. Damage and restoration.

1.2 PRODUCTS

- A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work.
- B. Products may also include existing materials or components required for reuse that were obtained from this project.
- C. Products specified or recycled from other projects are not considered new products.
- D. Provide interchangeable components of the same manufacturer, for similar components.
- E. Provide products that comply with the Contract Documents, that are undamaged and are unused at the time of installation.
- F. Provide products complete with all accessories, trim, finish, safety guards and other devices and detail needed for a complete installation and for the intended use and effect.
- G. Where a specific manufacturer's product is specified as the basis of design, the designation shall establish the qualities relating to type, function, dimension, in-service performance, physical properties, appearance and other characteristics for comparable products of other named manufacturers.
- H. Where products are specified by name or by manufacturer provide the product or manufacturer specified. No substitutions will be permitted unless made under the provisions of Section 01 25 13.
- I. Where specifications only describe a product or assembly by listing exact characteristics required, provide a product or assembly that provides the characteristics.
- J. Where specifications only require compliance with performance requirements, provide products that comply with those requirements.
- K. Where the specifications only require compliance with an imposed code, standard or regulation, provide a product that complies with the standards, codes or regulations specified.
- L. Where specifications require review and acceptance of a sample, the Architect's decision will be final on whether a proposed product sample is acceptable or not.
- M. Provide materials and products specified in the full range of color, texture and pattern for selection by Architect. Range shall include as advertised in product data and brochures. Unless otherwise indicated in individual specification sections, Architect may select from any color range at no additional cost to Owner.
- N. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.
- O. Where product is designated to match an existing product, provide product that matches in size, profile, finish, dimension and other characteristics the existing product identified.

1.3 TRANSPORTATION AND HANDLING

- A. Transport and handle products in accordance with manufacturer's instructions.
- B. Schedule delivery to minimize long-term storage at site to prevent overcrowding of construction spaces.
- C. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
- D. Deliver products in manufacturer's original sealed container or packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
- E. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.
- F. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.4 STORAGE

- A. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible.
- B. Store sensitive products in weather-tight, climate controlled enclosures.
- C. Store products in a manner that will not damage or overload project structure.
- D. For exterior storage of fabricated products, place on sloped supports, above ground.
- E. Provide off-site storage when site does not permit on-site storage .
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
- G. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- H. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- I. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.
- J. Prevent the discharge of pollutants to storm water from storage of materials on-site using best management practice techniques defined in Chapter 4 of the Construction Activity Handbook published by the Storm Water Quality Task Force.

1.5 PROTECTION

- 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 minimize damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Provide humidity and temperature control for installed products as recommended by materials manufacturer.
- G. Prohibit traffic from landscaped areas.

1.6 DAMAGE AND RESTORATIONS

- A. Damage to existing or new work whether accidental or not shall be restored or replaced as specified or directed by Architect.
- B. Restoration shall be equal to structural performance of original work.
- C. Finish shall match appearance of existing adjacent work.
- D. Work not properly restored or where not capable of being restored shall be removed and replaced.

2. PART 2 PRODUCTS

Not Used

3. PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 71 23.16

CONSTRUCTION SURVEYING

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. General: The Contract General Conditions and Division 1, General Requirements, including, but not limited to, summary of work, submittals and cleaning, shall form a part of these specifications with the same force and effect as though repeated herein. Work shall be done according to the Contract Documents and to the satisfaction of the Owner. That which is called for in one of the Contract Documents is binding as though called for in all.
- B. Care shall be taken to protect stakes, especially rough grade stakes, since they are used for reference throughout the construction process.
- C. The contractor shall request stakes from the Engineer when it is ready to use them and shall be responsible for their preservation for its future use. All requests shall be made in writing and faxed to the Engineer 48 hours prior to the time staking will be required.
- D. Should the work need to be restaked, for the contractor's use, the contractor shall be responsible for the cost of this restaking. Also, should the contractor destroy stakes, which are needed for improvements other than his own, it shall also be responsible for the cost of replacing the destroyed stakes.
- E. Staking will consist of the following:
 1. Demolition and Tree Removal:

Trees will be flagged or marked for saving or removal as specified by the Engineer and the boundary will be lathed for demolition if required. Contractor is to verify with Owner if and when perimeter fencing is to be removed.
 2. Rough Grade:
 - a. Top of curb cut or fill for BC, ER, EC and PRC and grade breaks on an offset to face of curb.
 - b. Building pad cut or fill stakes on an offset to pad.
 3. Sanitary Sewers:
 - a. The ends of sanitary laterals will be staked on an offset with a cut to flowline, within 5' of each building.
 4. Storm Drains:
 - a. Main lines will be staked on an offset at 50' stations on tangent with a cut to the invert of the pipe. All staking will commence at the low end of a particular drainage system.
 - b. End of pipes for catch basins will be staked on an offset with a cut or fill to pipe invert.
 - c. Area drains will be staked on an offset with a cut to the invert. Owner's Engineer may adjust top of grate elevations to consider as graded building pad elevations. Therefore, contractor must verify top of grate elevations with Owner's Engineer prior to setting grate to grade.
 5. Water Staking:
 - a. Mains will be constructed using face of curb stakes with cut or fill to top of curb as control.
 - b. Services to all buildings will be located at an offset with a marker for line only.
 - c. Curb and gutter control stakes will be set at hydrants for hydrant construction.

6. PG&E and Joint Trenches:
 - a. Joint trench facilities will be constructed using face of curb stakes with cut or fill to top of curb.
 - b. Curb & gutter control stakes will be set for transformer locations and for vaults larger than #5 boxes.
7. Curb and Gutter:
 - a. Curb and gutter will be staked on an offset to face of curb with a cut or fill on each stake to top of curb. Stakes will be placed for parking area curbs and valley gutters with stakes not exceeding 30' on curves in addition to all BCs, ECs, PRC's, ER's and grade breaks.
8. Storm Water Inlets:
 - a. Control for storm water curb inlets will be provided by staking horizontal and vertical location of curb and gutter at inlet locations. For inlets not in curbing, horizontal and vertical control will be provided for the inlet flow line and grate at the time storm drain is staked.
9. Building Corners:
 - a. Control for building envelopes will be provided as a set of offset stakes to actual corners. A minimum of four stakes will be provided, and one control stake in each building envelope referenced for foundation elevation control.
10. Completion Staking:
 - a. Control stakes for completion including any perimeter fences will be provided on an offset at approximate 50 foot intervals.
11. Monumentation:
 - a. No monuments are shown on the plans.

1.02 SPECIAL REQUIREMENTS

- A. The Engineer will provide plans which show four "as-built" elevations on each completed "building" pad for Owner's use in determining the acceptability of the work completed. This is to be done once. A minimum of 2 pads must be completed and free from obstruction prior to checking by Engineer. Additional checking for any contractor repair work required by Owner or request to check less than minimum number of pads shall be billed as additional services to contractor. As requested, Engineer shall also provide Owner with the "standard" governmental agency letter commenting on the as-graded building pad's general conformance with the approved Rough Grading Plan.

1.03 EXECUTION

- A. Control points and temporary benchmarks will be set prior to staking the project.
- B. Site engineering under this section shall be performed by a Registered Engineer, or Licensed Land Surveyor of the State of California. The Subcontractor shall furnish his own grade checker, at his expense. Report any irregularities in site dimensions or grades to the Engineer for clarification prior to the start of grading or installation of any portion of the work.

1.04 EXECUTION - SUBCONTRACTOR PROVIDED STAKING

- A. All subcontractor provided staking workmanship shall be of the best quality and meet acceptance of the Contractor.
- B. Scheduling and Coordination:
 1. Schedule: Subcontractor shall examine the schedule and check it for timing, accuracy and compatibility with his work and shall coordinate his work with the master schedule.

2. Coordination: Subcontractor shall assist the contractor in coordination and scheduling of all work pertinent to his installation and shall inform the contractor of his requirements sufficiently to result in a well-coordinated job.
- C. Grading Control:
1. All grading, including subgrading and finished grading of all areas, including parking areas, drives and walks, shall be controlled by such intermediate grade stakes and lines as may be necessary to insure slopes, lines and levels required by finished grade elevations indicated on drawings. Stakes shall be so spaced that a taut line between any two will not sag or drift. Intermediate staking and layout shall be by grading subcontractor.
 2. The Subcontractor shall be responsible for preserving all benchmarks, reference points, and construction stakes in the area, and he will be billed for any cost incurred in replacing any such benchmarks, reference points, or construction stakes which are destroyed as a result of his activities. Any construction stakes in addition to those specified herein will be provided to the contractor upon receipt of written request at his expense.
 3. In the event such extra staking is required, the Contractor shall have a company representative onsite to sign the field crew's assignment sheet before the staking is begun. At that time, upon request, the field crew, after conference with the office, will provide said representative with an estimate of the field time required for the services requested.
- D. Inspection and Approvals: The Contractor shall be advised and given notice and presented with copies of all records on substantial completion of this work.
- E. Clean-Up: Subcontractor shall keep his work areas in a workmanlike and safe condition and so that his rubbish, waste and debris do not interfere with the work of others. Upon completion of the work in this section, subcontractor shall remove all rubbish, waste and debris resulting from the operations off the site. Subcontractor shall remove all equipment and implements of services and leave entire area in a neat, clean acceptable condition to meet acceptance of contractor.

END OF SECTION

SECTION 01 73 00

EXECUTION REQUIREMENTS

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. General procedural requirements governing execution of the Work.
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. General installation of products.

1.2 SUBMITTALS

- A. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.
- B. Certified Surveys: Submit two copies signed by land surveyor.
- C. Final Property Survey: Submit 2 copies showing the Work performed and record survey data.

2. PART 2 PRODUCTS

Not Used

3. PART 3 EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: Existence and location of site improvements and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify existence and location of construction affecting the Work.
- B. Existing Utilities: Existence and location of underground and other utilities indicated as existing are not guaranteed. Before beginning work, investigate and verify existence and location of underground utilities affecting the Work.
 - 1. Before construction, verify location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and electrical services.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Written Report: Where conditions detrimental to performance of the Work are encountered, provide a written report listing the following:
 - (a) Description of the Work.
 - (b) List of detrimental conditions, including substrates.
 - (c) List of unacceptable installation tolerances.
 - (d) Recommended corrections.

2. Verify compatibility with and suitability of substrates, including compatibility of existing finishes or primers.
3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of need for clarification of Contract Documents, submit a Request For Information (RFI) to Architect. Include a detailed description of problem encountered, together with recommendations for resolution of the item discovered.

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
- B. General: Engage a land surveyor, registered in the state of California to lay out the Work using accepted surveying practices.
 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 3. Inform installers of lines and levels to which they must comply.
 4. Check the location, level and plumb, of every major element as the Work progresses.
 5. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
 6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 FIELD ENGINEERING

- A. Identification: Control datum for survey is that established by Owner provided survey.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
 - 1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
 - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 - 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 - 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.
- E. Final Property Survey: Prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
 - 1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
 - 4. Maintain maximum headroom clearance in spaces without a suspended ceiling.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

END OF SECTION

SECTION 01 73 29

CUTTING AND PATCHING

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Requirements and limitations for cutting and patching of Work.

1.2 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore surfaces to original or specified conditions after installation of other work.

1.3 REGULATORY REQUIREMENTS

- A. Unless specifically shown on the drawings, no structural member shall be cut, drilled, or notched without prior written authorization from the Architect.

1.4 SUBMITTALS

- A. Submit written request in advance of cutting or patching which affects:

1. Structural integrity of any element of Project.
2. Integrity of weather-exposed or moisture-resistant element.
3. Efficiency, maintenance, or safety of any operational element.
4. Visual qualities of sight exposed elements.
5. Work of Owner or separate contractor.

- B. Include in request:

1. Identification of Project.
2. Location and description of affected work.
3. Necessity for cutting or patching.
4. Description of proposed work, and Products to be used.
5. Alternatives to cutting and patching.
6. Effect on work of Owner or separate contractor.
7. Written permission of affected separate contractor.
8. Date and time work will be executed.

1.5 QUALITY ASSURANCE

- A. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. Do not cut or patch operating elements that would reduce their capacity to perform or that would result in increased maintenance or decreased operational life or safety.
- C. Do not cut or patch construction that would result in visual evidence of cutting or patching.
- D. Remove and replace construction that has been cut or patched in a visually unsatisfactory manner.

2. PART 2 PRODUCTS

2.1 MATERIALS

- A. Primary Products: Those required for original installation.
- B. Substitutions: Under provisions of Section 01 25 13.

3. PART 3 EXECUTION

3.1 EXAMINATION

- A. Inspect existing conditions prior to commencing Work, including elements subject to damage or movement during cutting and patching.
- B. After uncovering existing Work, inspect conditions affecting performance of work.
- C. Beginning of cutting or patching means acceptance of existing conditions.

3.2 PREPARATION

- A. Provide temporary supports to ensure structural integrity of the Work. Provide devices and methods to protect other portions of Project from damage.
- B. Provide protection from elements for areas which may be exposed by uncovering work.

3.3 CUTTING AND PATCHING

- A. Execute cutting, fitting, and patching to complete Work.
- B. Fit Products together, to integrate with other work.
- C. Uncover work to install ill timed work.
- D. Remove and replace defective or non-conforming work.
- E. Remove samples of installed work for testing when requested.
- F. Provide openings in the Work for penetration of mechanical and electrical work.
- G. Cut rigid materials using saw or drill. Pneumatic tools not allowed without prior approval.

3.4 PERFORMANCE

- A. Execute work by methods to avoid damage to other Work, and which will provide appropriate surfaces to receive patching and finishing.
- B. Employ skilled and experienced installer to perform cutting and patching.
- C. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- D. Restore work with new Products in accordance with requirements of Contract Documents.
- E. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- F. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material, to full thickness of the penetrated element.
- G. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

3.5 CLEANING

- A. Clean areas and spaces where cutting and patching was performed.
- B. Completely remove paint, mortar, oils, sealant, and similar materials.

END OF SECTION

SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Administrative and procedural requirements for the following:
 - 1. Recycling nonhazardous demolition and construction waste.
 - 2. Disposing of nonhazardous demolition and construction waste.

1.2 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, or renovation operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.3 PERFORMANCE GOALS

- A. General: Develop waste management plan that results in end-of-Project rates for salvage/recycling of 50 percent by weight of total waste generated by the Work.
- B. Salvage/Recycle Requirements: Salvage and recycle as much nonhazardous demolition and construction waste as possible including the following materials:
 - 1. Demolition Waste:
 - (a) Concrete.
 - (b) Concrete reinforcing steel.
 - (c) Wood studs.
 - (d) Wood joists.
 - (e) Plywood and oriented strand board.
 - (f) Wood paneling.
 - (g) Wood trim.
 - (h) Rough hardware.
 - (i) Roofing.
 - (j) Insulation.
 - (k) Doors and frames.
 - (l) Door hardware.
 - (m) Glazing.
 - (n) Gypsum board.
 - (o) Equipment.
 - (p) Cabinets.
 - (q) Plumbing fixtures.
 - (r) Piping.
 - (s) Supports and hangers.
 - (t) Valves.
 - (u) Mechanical equipment.
 - (v) Refrigerants.
 - (w) Electrical conduit.
 - (x) Copper wiring.
 - (y) Lighting fixtures.
 - (z) Lamps.
 - (aa) Ballasts.
 - (bb) Electrical devices.

2. Construction Waste:

- (a) Lumber.
- (b) Wood sheet materials.
- (c) Wood trim.
- (d) Metals.
- (e) Roofing.
- (f) Insulation.
- (g) Gypsum board.
- (h) Piping.
- (i) Electrical conduit.
- (j) Packaging: Regardless of salvage/recycle goal indicated above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
 - (1) Paper.
 - (2) Cardboard.
 - (3) Boxes.
 - (4) Plastic sheet and film.
 - (5) Polystyrene packaging.
 - (6) Wood crates.
 - (7) Plastic pails.

1.4 SUBMITTALS

- A. Submit waste management plan and progress reports under the provisions of Section 01 33 00.
- B. Waste Management Plan: Submit plan within 7 days of date established for the Notice of Award.
- C. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit reports. Include separate reports for demolition and construction waste. Include the following information:
 - 1. Material category.
 - 2. Generation point of waste.
 - 3. Total quantity of waste in tons.
 - 4. Quantity of waste salvaged, both estimated and actual in tons.
 - 5. Quantity of waste recycled, both estimated and actual in tons.
 - 6. Total quantity of waste recovered (salvaged plus recycled) in tons.
 - 7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- D. Forms: Prepare waste reduction progress reports on forms included at end of Part 3.
- E. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- F. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- G. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- H. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- I. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- J. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.5 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

- C. Waste Management Conference: Conduct conference at Project site to comply with requirements in Division 01 Section 01 31 00 - Project Management and Coordination. Review methods and procedures related to waste management including, but not limited to, the following:
 - 1. Review and discuss waste management plan.
 - 2. Review requirements for documenting quantities of each type of waste and its disposition.
 - 3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - 4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - 5. Review waste management requirements for each trade.

1.6 WASTE MANAGEMENT PLAN

- A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of demolition and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
 - 2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - 3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - 4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
 - 5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
 - 6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.
- D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Include the following:
 - 1. Total quantity of waste.
 - 2. Estimated cost of disposal (cost per unit). Include hauling and tipping fees and cost of collection containers for each type of waste.
 - 3. Total cost of disposal (with no waste management).
 - 4. Revenue from salvaged materials.
 - 5. Revenue from recycled materials.
 - 6. Savings in hauling and tipping fees by donating materials.
 - 7. Savings in hauling and tipping fees that are avoided.
 - 8. Handling and transportation costs. Include cost of collection containers for each type of waste.
 - 9. Net additional cost or net savings from waste management plan.
- E. Forms: Prepare waste management plan on forms included at end of Part 3.

2. PART 2 PRODUCTS

Not Used

3. PART 3 EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 - 1. Distribute waste management plan to everyone concerned within 3 days of submittal return.
 - 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 - 2. Comply with Division 01 Section 01 50 00 - Temporary Facilities and Controls, for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

- A. Salvaged Items for Reuse in the Work:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until installation.
 - 4. Protect items from damage during transport and storage.
 - 5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
- B. Salvaged Items for Sale: Not permitted to be sold on Project site.
- C. Salvaged Items for Donation: Permitted on Project site.
- D. Salvaged Items for Owner's Use:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to Owner's storage area off-site designated by Owner.
 - 5. Protect items from damage during transport and storage.
- E. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.

3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Receivers and Processors: Licensed entity normally engaged in the business of receiving, recycling, and processing waste materials with a minimum of 5 years of documented experience with the types of waste products to be processed under the provisions of this section.

- C. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall be shared equally by Owner and Contractor.
- D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
 - 1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - 2. Inspect containers and bins for contamination and remove contaminated materials if found.
 - 3. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 4. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - 5. Store components off the ground and protect from the weather.
 - 6. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

3.4 RECYCLING DEMOLITION WASTE

- A. Concrete Reinforcement: Remove reinforcement and other metals from concrete and sort with other metals.
- B. Concrete: Break up and transport to concrete-recycling facility.
- C. Concrete: Crush concrete and screen to comply with requirements in Divisions 31 and 32 and Section 31 20 00 - Earth Moving for use as satisfactory soil for fill and Section 32 13 13 - Concrete Paving as granular base.
- D. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- E. Metals: Separate metals by type.
 - 1. Structural Steel: Stack members according to size, type of member, and length.
 - 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- F. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.
- G. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
- H. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
- I. Acoustical Ceiling Suspension Systems: Separate suspension system, trim, and other metals from panels and tile and sort with other metals.
- J. Carpet and Pad: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
- K. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.
- L. Plumbing Fixtures: Separate by type and size.
- M. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.
- N. Lighting Fixtures: Separate lamps by type and protect from breakage.
- O. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.
- P. Conduit: Reduce conduit to straight lengths and store by type and size.

3.5 RECYCLING CONSTRUCTION WASTE

A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
2. Polystyrene Packaging: Separate and bag materials.
3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
 - (a) Comply with requirements in Division 32 Section 32 90 00 - Planting for use of clean sawdust as organic mulch.

C. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location.

1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.
 - (a) Comply with requirements in Division 32 Section 32 90 00 - Planting for use of clean ground gypsum board as inorganic soil amendment.

3.6 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
- B. Do not allow waste materials that are to be disposed of accumulate on-site. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- C. Burning: Do not burn waste materials.
- D. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION

CONSTRUCTION WASTE REDUCTION PROGRESS REPORT

MATERIAL CATEGORY	GENERATION POINT	TOTAL QUANTITY OF WASTE TONS (A)	QUANTITY OF WASTE SALVAGED		QUANTITY OF WASTE RECYCLED		TOTAL QUANTITY OF WASTE RECOVERED TONS (D = B + C)	TOTAL QUANTITY OF WASTE RECOVERED % (D/Ax100)
			ESTIMATED TONS	ACTUAL TONS (B)	ESTIMATED TONS	ACTUAL TONS (C)		
Packaging: Cardboard								
Packaging: Boxes								
Packaging: Plastic Sheet or Film								
Packaging: Polystyrene								
Packaging: Pallets or Skids								
Packaging: Crates								
Packaging: Paint Cans								
Packaging: Plastic Pails								
Site-Clearing Waste								
Lumber: Cut-Offs								
Lumber: Warped Pieces								
Plywood or OSB (scraps)								
Wood Forms								
Wood Waste Chutes								
Wood Trim (cut-offs)								
Metals								
Insulation								
Joint Sealant Tubes								
Gypsum Board (scraps)								
Piping								
Electrical Conduit								
Other:								

DEMOLITION WASTE REDUCTION PROGRESS REPORT

MATERIAL CATEGORY	GENERATION POINT	TOTAL QUANTITY OF WASTE TONS (A)	QUANTITY OF WASTE SALVAGED		QUANTITY OF WASTE RECYCLED		TOTAL QUANTITY OF WASTE RECOVERED TONS (D=B+C)	TOTAL QUANTITY OF WASTE RECOVERED % (D/Ax100)
			ESTIMATED TONS	ACTUAL TONS (B)	ESTIMATED TONS	ACTUAL TONS (C)		
Concrete								
Lumber								
Plywood and OSB								
Wood Paneling								
Wood Trim								
Miscellaneous Metals								
Structural Steel								
Rough Hardware								
Insulation								
Doors and Frames								
Door Hardware								
Equipment								
Cabinets								
Plumbing Fixtures								
Piping								
Supports and Hangers								
Valves								
Sprinklers								
Mechanical Equipment								
Electrical Conduit								
Copper Wiring								
Light Fixtures								
Lamps								
Lighting Ballasts								
Electrical Devices								
Other:								

CONSTRUCTION WASTE IDENTIFICATION							
MATERIAL CATEGORY	GENERATION POINT	EST. QUANTITY OF MATERIALS RECEIVED (A)	EST. WASTE - % (B)	TOTAL EST. QUANTITY OF WASTE* (C=AxB)	EST. VOLUME CY	EST. WEIGHT TONS	REMARKS AND ASSUMPTIONS
Packaging: Cardboard							
Packaging: Boxes							
Packaging: Plastic Sheet or Film							
Packaging: Polystyrene							
Packaging: Pallets or Skids							
Packaging: Crates							
Packaging: Paint Cans							
Packaging: Plastic Pails							
Site-Clearing Waste							
Lumber: Cut-Offs							
Lumber: Warped Pieces							
Plywood or OSB (scraps)							
Wood Forms							
Wood Waste Chutes							
Wood Trim (cut-offs)							
Metals							
Insulation							
Joint Sealant Tubes							
Gypsum Board (scraps)							
Piping							
Electrical Conduit							
Other:							

* Insert units of measure.

DEMOLITION WASTE IDENTIFICATION				
MATERIAL DESCRIPTION	EST. QUANTITY	EST. VOLUME CY	EST. WEIGHT TONS	REMARKS AND ASSUMPTIONS
Concrete				
Lumber				
Plywood and OSB				
Wood Paneling				
Wood Trim				
Miscellaneous Metals				
Rough Hardware				
Insulation				
Doors and Frames				
Door Hardware				
Equipment				
Cabinets				
Plumbing Fixtures				
Piping				
Piping Supports and Hangers				
Valves				
Mechanical Equipment				
Electrical Conduit				
Copper Wiring				
Light Fixtures				
Lamps				
Lighting Ballasts				
Electrical Devices				
Switchgear and Panelboards				
Other:				

CONSTRUCTION WASTE REDUCTION WORK PLAN						
MATERIAL CATEGORY	GENERATION POINT	TOTAL EST. QUANTITY OF WASTE TONS	DISPOSAL METHOD AND QUANTITY			HANDLING AND TRANSPORTATION PROCEDURES
			EST. AMOUNT SALVAGED TONS	EST. AMOUNT RECYCLED TONS	EST. AMOUNT DISPOSED TO LANDFILL TONS	
Packaging: Cardboard						
Packaging: Boxes						
Packaging: Plastic Sheet or Film						
Packaging: Polystyrene						
Packaging: Pallets or Skids						
Packaging: Crates						
Packaging: Paint Cans						
Packaging: Plastic Pails						
Site-Clearing Waste						
Lumber: Cut-Offs						
Lumber: Warped Pieces						
Plywood or OSB (scraps)						
Wood Forms						
Wood Waste Chutes						
Wood Trim (cut-offs)						
Metals						
Insulation						
Joint Sealant Tubes						
Gypsum Board (scraps)						
Piping						
Electrical Conduit						
Other:						

DEMOLITION WASTE REDUCTION WORK PLAN

MATERIAL CATEGORY	GENERATION POINT	TOTAL EST. QUANTITY OF WASTE TONS	DISPOSAL METHOD AND QUANTITY			HANDLING & TRANSPORTION PROCEDURES
			EST. AMOUNT SALVAGED TONS	EST. AMOUNT RECYCLED TONS	EST. AMOUNT DISPOSED TO LANDFILL TONS	
Concrete						
Lumber						
Plywood and OSB						
Wood Paneling						
Wood Trim						
Miscellaneous Metals						
Structural Steel						
Rough Hardware						
Insulation						
Doors and Frames						
Door Hardware						
Acoustical Tile						
Equipment						
Cabinets						
Plumbing Fixtures						
Piping						
Supports and Hangers						
Valves						
Mechanical Equipment						
Electrical Conduit						
Copper Wiring						
Light Fixtures						
Lamps						
Lighting Ballasts						
Electrical Devices						
Other:						

COST/REVENUE ANALYSIS OF CONSTRUCTION WASTE REDUCTION WORK PLAN

MATERIALS	TOTAL QUANTITY OF MATERIALS (VOL. OR WEIGHT) (A)	EST. COST OF DISPOSAL (B)	TOTAL EST. COST OF DISPOSAL (C = A x B)	REVENUE FROM SALVAGED MATERIALS (D)	REVENUE FROM RECYCLED MATERIALS (E)	LANDFILL TIPPING FEES AVOIDED (F)	HANDLING AND TRANSPORTATION COSTS AVOIDED (G)	NET COST SAVINGS OF WORK PLAN (H = D+E+F+G)
Packaging: Cardboard								
Packaging: Boxes								
Packaging: Plastic Sheet or Film								
Packaging: Polystyrene								
Packaging: Pallets or Skids								
Packaging: Crates								
Packaging: Paint Cans								
Packaging: Plastic Pails								
Site-Clearing Waste								
Lumber: Cut-Offs								
Lumber: Warped Pieces or OSB								
Wood Forms								
Wood Waste Chutes								
Wood Trim (cut-offs)								
Metals								
Insulation								
Joint Sealant Tubes								
Gypsum Board (scraps)								
Piping								
Electrical Conduit								
Other:								

COST/REVENUE ANALYSIS OF DEMOLITION WASTE REDUCTION WORK PLAN

MATERIALS	TOTAL QUANTITY OF MATERIALS (VOL. OR WEIGHT) (A)	EST. COST OF DISPOSAL (B)	TOTAL EST. COST OF DISPOSAL (C= A x B)	REVENUE FROM SALVAGED MATERIALS (D)	REVENUE FROM RECYCLED MATERIALS (E)	LANDFILL TIPPING FEES AVOIDED (F)	HANDLING AND TRANSPORTATION COSTS AVOIDED (G)	NET COST SAVINGS OF WORK PLAN (H = D+E+F+G)
Lumber								
Plywood and OSB								
Wood Paneling								
Wood Trim								
Miscellaneous Metals								
Rough Hardware								
Insulation								
Doors and Frames								
Door Hardware								
Acoustical Tile								
Equipment								
Cabinets								
Plumbing Fixtures								
Piping								
Supports and Hangers								
Valves								
Mech. Equipment								
Electrical Conduit								
Conner Wiring								
Light Fixtures								
Lamps								
Lighting Ballasts								
Electrical Devices								
Other:								

SECTION 01 77 00

CLOSEOUT PROCEDURES

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Closeout Procedures.
- B. Final Cleaning.
- C. Pest Control.
- D. Adjusting.
- E. Demonstration and Instructions.
- F. Project Record Documents.
- G. Operation and Maintenance Data.
- H. Warranties.
- I. Spare Parts and Maintenance Materials.
- J. DVBE Participation Report.

1.2 PROJECT CLOSEOUT CONFERENCE

- A. As specified under Section 01 31 00.

1.3 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's review.
- B. Prepare and submit to Architect a list of items to be completed or corrected, the value of the items on the list, and reasons why the Work is not complete.
- C. Submit written request to Architect for review of Work.
- D. Submit warranties, bonds, service agreements, certifications, record documents, maintenance manuals, receipt of spare parts and similar closeout documents.
- E. Make final changeover of permanent locks and deliver keys to Owner.
- F. Terminate and remove temporary facilities from Project site.
- G. Advise Owner of change over in heat and other utilities.
- H. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- I. Submit affidavit of payment of debts and claims, AIA Document G706.
- J. Submit affidavit of release of liens, AIA Document G706A.
- K. Submit consent of contractors surety to final payment, AIA Document G707.
- L. Owner will occupy portions of the building as specified in Section 01 11 00.

1.4 REGULATORY REQUIREMENTS

- A. Provide submittals to Architect that are required by governing or other authority.

1.5 FINAL CLEANING

- A. Execute final cleaning prior to final review by Architect.
- B. Employ experienced professional cleaners for final cleaning.
- C. Clean interior and exterior glass and surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces.
- D. Vacuum carpeted and soft surfaces. Shampoo if visible stains exist.
- E. Clean equipment and plumbing fixtures to a sanitary condition.
- F. Clean exposed surfaces of grilles, registers and diffusers.
- G. Replace filters of operating mechanical equipment.
- H. Clean debris from roofs, gutters, downspouts, and drainage systems.
- I. Clean site; sweep paved areas, rake clean landscaped surfaces.
- J. Remove waste and surplus materials, rubbish, and construction facilities from the site.
- K. Clean light fixtures and replace burned out lamps and bulbs.
- L. Relamp all lamps and bulbs in lighting fixtures.
- M. Replace defective and noisy ballasts and starters in fluorescent fixtures.
- N. Leave project clean and ready for occupancy by Owner.

1.6 PEST CONTROL

- A. Engage an experienced, licensed exterminator to make final inspection and rid Project of rodents, insects, and other pests. Submit final report to Architect.

1.7 ADJUSTING

- A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

1.8 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of products, systems, and equipment to Owner's personnel two weeks prior to date of final review.
- B. For each demonstration submit list of participants in attendance.
- C. Provide two copies of video tape of each demonstration and instructions session.
- D. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- E. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- F. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed-upon times, at equipment location.
- G. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

1.9 PROJECT RECORD DOCUMENTS

- A. Maintain on site, one set of the following record documents; record actual revisions to the Work in contrasting color.
 - 1. Contract Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other Modifications to the Contract.
 - 5. Reviewed shop drawings, product data, and samples.
- B. Store Record Documents separate from documents used for construction.
- C. Record information concurrent with construction progress.
- D. Specifications: Legibly mark and record at each Product Section in contrasting color ink, description of actual Products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Supplier and installer's name and contact information.
 - 3. Changes made by Addenda and Modifications.
- E. Contract Drawings and Shop Drawings: Legibly mark each item in contrasting color ink 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.
 - 5. Revisions to electrical circuitry and locations of electrical devices and equipment.
 - 6. Note change orders, alternate numbers, and similar information, where applicable.
 - 7. Identify each record drawing with the written designation of "RECORD DRAWING" located in prominent location.
- F. Record Digital Data Files: Immediately before inspection for Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
 - 1. Format: Annotated PDF electronic file with comment function enabled.
 - 2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 - 3. Refer instances of uncertainty to Architect for resolution.
 - 4. Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information.
 - (a) Refer to Section 01 33 00 "Submittal Procedures" for requirements related to use of Architect's digital data files.
 - (b) Architect will provide data file layer information. Record markups in separate layers.

- G. Final Property Survey: Under the provisions of Section 01 73 00.
- H. Record Construction Schedule: Under the provisions of Section 01 32 16.
- I. Submit documents to Architect at time of Substantial Completion.

1.10 OPERATION AND MAINTENANCE DATA

- A. Summary:
 - 1. Organize operation and maintenance data with directory.
 - 2. Provide operation and maintenance manuals for products, systems, subsystems, and equipment.
 - 3. Refer to Divisions 02 thru 49 for specific operation and maintenance manual requirements for the Work in those Divisions.
- B. Submit two sets prior to final review, bound in 8-1/2 inch x 11 inch, three ring D size binders with durable vinyl covers.
- C. Prepare binder covers with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, and subject matter of binder when multiple binders are required.
- D. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with laminated plastic tabs.
- E. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Engineers, Contractor, subcontractors, and major equipment suppliers and manufacturers.
- F. Part 2: Operation and maintenance instructions, arranged by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
 - 1. Performance and design criteria.
 - 2. List of equipment.
 - 3. Parts list for each component.
 - 4. Start-up procedures.
 - 5. Shutdown instructions.
 - 6. Normal operating instructions.
 - 7. Wiring diagrams.
 - 8. Control diagrams.
 - 9. Maintenance instructions for equipment and systems.
 - 10. Maintenance instructions for finishes, including recommended cleaning methods and materials.
- G. Part 3: Project documents and certificates, including the following:
 - 1. Shop drawings and product data.
 - 2. Air and water balance reports.
 - 3. Certificates.
 - 4. Warranties

1.11 WARRANTIES

- A. Commencement of warranties shall be date of Substantial Completion.
- B. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.
- C. Provide duplicate notarized copies in operation and maintenance manuals.
- D. Each prime contractor is responsible for warranties related to its own contract.
- E. Execute and assemble documents from subcontractors, suppliers, and manufacturers.
- F. Provide Table of Contents and assemble in binder with durable plastic cover.
- G. Submit prior to final Application for Payment.
- H. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of warranty on the work that incorporates the products.
- I. Manufacturer's disclaimer and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with Contractor.
- J. When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.
- K. When work covered by warranty has failed and has been corrected, reinstate warranty by written endorsement. Reinstated warranty shall be equal to original warranty with equitable adjustment for depreciation.
- L. Upon determination that Work covered by warranty has failed, replace or repair Work to an acceptable condition complying with requirements of the Contract Documents.

1.12 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification Sections.
- B. Deliver to Project site and place in location as directed.
- C. Obtain signed receipt for delivery of materials and submit prior to request for final review by Architect.

1.13 DISABLED VETERAN BUSINESS ENTERPRISE ("DBVE") PARTICIPATION

- A. Submit DVBE Participation Report as stipulated by Document 00 65 73.
- B. Provide supplemental report to substantiate non-compliance with District goal of three percent (3%) participation if required.

2. PART 2 PRODUCTS

Not Used

3. PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 02 40 00

DEMOLITION

PART 1 -GENERAL

1.01 SUMMARY

- A. Removing above-grade site improvements within limits indicated.
- B. Disconnecting, capping or sealing, and abandoning site utilities in place.
- C. Disconnecting, capping or sealing, and removing site utilities.
- D. Disposing of objectionable material.

1.02 RELATED SECTIONS

- A. Section 31 23 00 – Excavation and Fill.
- B. Section 31 23 33 – Trenching and Backfill.

1.03 RELATED DOCUMENTS

- A. California Building Code: Chapter 33 – Site Work, Demolition and Construction.
- B. California Building Code: Section 1809A.14 – Pipes and Trenches.

1.04 DEFINITIONS

- A. ANSI: American National Standards Institute.
- B. CAL-OSHA: California Occupational Safety and Health Administration.

1.05 SUBMITTALS

- A. Follow Submittal procedure outlined in Section 01 33 00 – Submittal Procedures.

1.06 PROJECT CONDITIONS

- A. Except for materials indicated to be stockpiled or to remain the Owner's property, cleared materials are the Contractor's property. Remove cleared materials from site and dispose of in lawful manner.
- B. Salvable Improvements: Carefully remove items indicated to be salvaged and store where indicated on plans or where designated by the Owner. Avoid damaging materials designated for salvage.
- C. Unidentified Materials: If unidentified materials are discovered, including hazardous materials that will require additional removal other than is required by the Contract Documents, immediately report the discovery to the Owner. If necessary, the Owner will arrange for any testing or analysis of the discovered materials and will provide instructions regarding the removal and disposal of the unidentified materials.

PART 2 -PRODUCTS

2.01 SOIL MATERIALS

- A. Backfill excavations resulting from demolition operations with on-site or import materials conforming to structural backfill defined in Section 31 23 00 – Excavation and Fill.

PART 3 -EXECUTION

3.01 PREPARATION

- A. Protect and maintain benchmarks and survey control points during construction.
- B. Protect existing site improvements to remain during construction.

3.02 RESTORATION

- A. Restore damaged improvements to their original condition, as acceptable to the Owner.

3.03 UTILITIES

- A. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed or abandoned.
- B. Arrange to shut off indicated utilities with utility companies or verify that utilities have been shut off.
- C. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless authorized in writing by the Owner, and then only after arranging to provide temporary utility services according to requirements indicated.
- D. Coordinate utility interruptions with utility company affected.
- E. Do not proceed with utility interruptions without the permission of the Owner and utility company affected. Notify Owner and utility company affected two working days prior to utility interruptions.
- F. Excavate and remove underground utilities that are indicated to be removed.
- G. Securely close ends of abandoned piping with tight fitting plug or wall of concrete minimum 6-inches thick.

3.04 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, and gutters, as indicated. Where concrete slabs, curb, gutter and asphalt pavements are designated to be removed, remove bases and subbase to surface of underlying, undisturbed soil.
- C. Unless the existing full-depth joints coincide with line of pavement demolition, neatly saw-cut to full depth the length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.
- D. Remove driveways, curbs, gutters and sidewalks by saw cutting to full depth. If saw cut falls within 30-inches of a construction joint, expansions joint, score mark or edge, remove material to joint, mark or edge.

3.05 BACKFILL

- A. Place and compact material in excavations and depressions remaining after site clearing in conformance with Section 31 23 33 – Trenching and Backfill.

3.06 DISPOSAL

- A. Remove surplus obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off the Owner's property.

END OF SECTION

SECTION 02 41 19

SELECTIVE DEMOLITION

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Removal of designated building equipment and fixtures.
- B. Removal of designated construction.
- C. Disposal of materials.
- D. Storage of salvaged materials.
- E. Cap and identify utilities.
- F. Temporary partitions to allow building occupancy.
- G. Temporary fire protection.
- H. Schedule of materials and equipment.

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or recycled.
- B. Disposal: Removal off-site of demolition waste and subsequently deposit in landfill acceptable to authorities having jurisdiction.
- C. Recycle: Recovery of demolition waste for subsequent processing.
- D. Existing to Remain: Items of construction that are not to be removed and that are not indicated to be removed salvaged, or recycled.

1.3 MATERIALS OWNERSHIP

- A. Historic items, relics, cornerstones, commemorative plaques, tablets and similar objects encountered during demolition are to remain the Owner's property.
- B. Carefully remove each item in a manner to prevent damage and deliver to Owner.

1.4 SUBMITTALS

- A. Predemolition Photographs: Show conditions of exiting adjacent construction and site improvements that might be misconstrued as damaged by demolition operations. Submit before work begins.
- B. Record Documents: Submit under provisions of Section 01 77 00. Accurately record locations of utilities and subsurface obstructions.

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable codes for demolition work, safety of structure, electrical disconnection and reconnection dust control and disposal of materials.
- B. Comply with California Fire Code (CFC), California Code of Regulations, (CCR) Title 24, Part 9, Chapter 5 - Fire Service Features and Chapter 33 - Fire Safety During Construction and Demolition.
- C. Obtain required permits from authorities.

- D. Notify affected utility companies before starting work and comply with their requirements.
- E. Do not close or obstruct egress width to exits.
- F. Do not disable or disrupt building fire or life safety systems without 3 day prior written notice to the Owner.

1.6 EXISTING CONDITIONS

- A. Areas of buildings to be demolished will be evacuated and their use discontinued before start of work.
- B. Owner will occupy building(s) adjacent to demolition area. Conduct demolition so owner's operation will not be disrupted.
- C. Provide at least 72 hour notice to Owner of activities that will affect Owner's operation.
- D. Maintain access to existing walkways, exits and other adjacent occupied facilities.
- E. Owner assumes no responsibility for areas of buildings to be demolished.
- F. Hazardous Materials: It is not anticipated that hazardous materials will be encountered in the work.
 - 1. Hazardous materials will be removed by Owner before start of work.
 - 2. Hazardous materials will be removed by Owner under separate contract.
 - 3. If materials suspected of containing hazardous materials are encountered, do not disturb. Notify Architect.
 - 4. Conform to applicable regulatory procedures when discovering hazardous or contaminated materials.

1.7 SCHEDULING

- A. Schedule work under provisions of Section 01 32 16.
- B. Schedule Work to coincide with new construction.
- C. Perform work during normal hours of operation.
- D. Notify Owner in writing 5 days in advance of any required work to be performed on a weekend or holiday.
- E. Perform noisy or dusty work:
 - 1. Between the hours of TBD and TBD.
- F. Coordinate utility and building service interruptions with Owner.
- G. Schedule tie-ins to existing systems to minimize disruption.
- H. Coordinate Work to ensure fire sprinklers, fire alarms, smoke detectors, emergency lighting, exit signs and other life safety systems remain in full operation in occupied areas.

1.8 PROJECT CONDITIONS

- A. Conduct demolition to minimize interference with adjacent building areas.
- B. Cease operations immediately if structure appears to be in danger and notify Architect. Do not resume operations until directed.

2. PART 2 PRODUCTS

Not Used

3. PART 3 EXECUTION

3.1 EXAMINATION

- A. Correlate existing conditions with requirements indicated.
- B. Inventory and record condition of items to be removed and salvaged.
- C. Execute predemolition photographs.
- D. Verify that hazardous waste remediation is complete.

3.2 PREPARATION

- A. Existing Utilities: Locate, identify, disconnect and seal or cap off indicated utilities serving areas to be demolished.
- B. Salvaged Items: Clean, pack and identify items for delivery to Owner.
- C. Protect existing items which are not indicated to be salvaged, removed, or altered.
- D. Erect and maintain weatherproof closures for exterior openings.
- E. Erect and maintain temporary partitions to prevent spread of dust, fumes, noise, and smoke to provide for Owner occupancy as specified in Section 01 11 00.

3.3 DEMOLITION

- A. Conduct demolition to minimize interference with adjacent building areas.
- B. Cease operations immediately if structure appears to be in danger. Notify Architect. Do not resume operations until directed.
- C. Maintain protected egress and access to the Work.
- D. Maintain fire safety during demolition in accordance with CFC, Chapter 33.
- E. Demolish in an orderly and careful manner. Protect existing supporting structural members.

3.4 SALVAGING OF DEMOLITION MATERIALS

- A. Salvage materials under the provisions of Section 01 74 19.
- B. Clean salvaged items.
- C. Pack or crate items after cleaning. Identify contents.
- D. Store items in secure area until delivery to Owner .
- E. Protect items from damage.

3.5 RECYCLING OF DEMOLITION MATERIALS

- A. Recycle demolition waste under the provisions of Section 01 74 19.
- B. Stockpile processed materials on-site without intermixing with other materials.
- C. Do not store materials within drip line of trees.
- D. Transport recyclable materials that are not indicated to be reused off Owner's property to recycling receiver or processor.

- E. Recycled incentives received for building demolition materials shall be equally shared between Contractor and Owner.
- F. Wood Materials: Sort and stack members according to size, type and length. Separate dimensional and engineered lumber, panel products, and treated wood materials.
- G. Metals: Separate by metal type. Remove nuts, bolts and rough hardware. Sort structural steel by type and size.
- H. Doors and Hardware: Brace open end of door frames. Leave hardware attached to doors.
- I. Gypsum Board: Stack large clean pieces on pallets. Remove edge trim and sort with metals. Remove and dispose of fasteners.
- J. Equipment: Drain tanks, piping and fixtures. Seal openings with caps or plugs.
- K. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves and other components.
- L. Lighting Fixtures: Remove lamps and separate by type.
- M. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.
- N. Conduit: Reduce conduit to straight lengths and store by type and size.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. Except for items to be recycled, salvaged, or otherwise indicated to remain, remove demolished materials from Project site and legally dispose of them in an EPA – approved landfill.
- B. Do not burn or bury materials on site.

3.7 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt and debris caused by demolition.
- B. Remove temporary construction.
- C. Return adjacent areas to condition existing before demolition operations began.
- D. Leave site in a clean condition.

END OF SECTION

SECTION 03 10 00

CONCRETE FORMWORK

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Formwork for cast-in-place concrete.
- B. Form openings for mechanical and electrical work.
- C. Coordinate installation of items supplies under other specification sections.

1.2 RELATED SECTIONS

- A. Section 03 30 00: Cast-in-Place Concrete
- B. Section 03 20 00: Concrete Reinforcing
- C. Mechanical and electrical items to be embedded in concrete.

1.3 QUALITY ASSURANCE

A. Design Requirements:

- 1. All work shall California Code of Regulations. Title 24, 2016 edition, also known as California Building Code (CBC).
- 2. Responsibility: Design of formwork is the Subcontractor's responsibility. Comply with the following, except as modified by the Building Code or these specifications.
 - (a) ACI 301 - "Specifications for Structural Concrete for Buildings."
 - (b) ACI 347 - "Recommended Practice for Concrete Formwork."
 - (c) ACI 303R - "Guide to Cast-in-Place Architectural Concrete Practice."
- 3. Allowable Tolerances:
 - (a) Construct formwork to provide completed cast-in-place concrete surfaces complying with the tolerances specified in ACI 347.
 - (b) Note special tolerance requirements for locations of drains where indicated on drawings.

1.4 SUBMITTALS

- A. Product Data: Submit Manufacturer's data and installation instructions for proprietary materials such as form coatings, manufactured form systems, ties and accessories.
- B. Submit manufacturer's certification that form release agent will provide clean, stainfree surfaces of concrete and not interfere with bond of applied finishes.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver form release agents in manufacturer's sealed and trademarked containers.

2. PART 2 PRODUCTS

2.1 FORM MATERIALS

- A. General: Form material shall be as required to produce continuous, straight, smooth exposed surfaces. Materials selected shall be satisfactory to Architect for effect on finished appearance of concrete. Architectural concrete formwork shall be of one material throughout the work, for all similar types of concrete surfaces.

- B. Exposed Non-Architectural Concrete:
 - 1. Metal or APA graded Plyform, Grade BB, Class I or II, or HDO plywood exterior type, each piece graded, no mill oiling. Use one form face material throughout the project for similar types of concrete surfaces.
 - 2. Provide material and bracing with sufficient thickness to withstand pressure of newly placed concrete without bow or deflection.
- C. Concealed Concrete: Plywood, lumber, metal, or other acceptable material. Provide lumber that is dressed on at least 2 edges and 1 side. "Concealed" means not visible in the completed structure. (Painted concrete is not to be considered "concealed".)
- D. Form Ties:
 - 1. Provide snap ties with plastic cones of same size and shape and of same manufacturer as cement cone hole plugs provided under Concrete Section.
 - 2. Wire ties and site fabricated ties and wood separators are not acceptable.
- E. Form Coatings: Commercial formulation resin-based form-coating compounds that will not bond with, stain, nor adversely affect concrete surfaces, and will not impair subsequent treatment of concrete surfaces requiring bond, or adhesion, nor impede the wetting of surfaces to be cured with water or curing compounds. Oils and petroleum distillates are not acceptable. Verify compatibility of form coating with proposed surface finish.
- F. Metal Inserts: Provide metal inserts for anchorage of materials or equipment to concrete construction, where not supplied by other trades and required for the work.
- G. Earth forms permitted for footings.

2.2 FORMWORK SYSTEMS

- A. Design, erect, support, brace and maintain formwork so that it will safely support vertical and lateral loads that might be applied, until such loads can be supported by the concrete structure. Construct formwork so that concrete members and structures are of correct size, shape, alignment, elevation and position.
- B. Design forms to include assumed values of live load, dead load, weight of moving equipment operated on formwork, concrete mix, height of concrete drop, vibrator frequency, ambient temperature, foundation pressures, stresses, lateral stability, and other factors pertinent to safety of structuring during construction.
- C. Design formwork to be readily removable without impact, shock or damage to cast-in-place concrete surfaces and adjacent materials.
- D. Provide formwork sufficiently tight to prevent leakage of cement past during concrete placement. Solidly butt and gasket joints and provide backup material at joints to prevent leakage and fins.

3. PART 3 EXECUTION

3.1 INSPECTION

- A. Examine surfaces and conditions receiving or affecting the work. Do not proceed until unsuitable conditions have been corrected.

3.2 FORM CONSTRUCTION

- A. General: Construct forms complying with ACI 347 and ACI 303R, as applicable to the sizes, shapes, lines and dimensions shown, and to accurate alignment, location, grades, levels, and plumbness. Provide for openings, sleeves, offsets, recesses, reglets, chamfers, inserts, and other features required. Use selected materials to obtain required finishes. Before placing concrete, check the lines and levels of erected formwork. Make corrections and adjustments to ensure proper size and location of concrete members and stability of forming system.

- B. Ties:
1. Spacing: Space ties in a uniform pattern satisfactory to the Architect. Rest cones firmly against forms and seal to prevent leakage.
- C. Corner Treatment:
1. Make all corners chamfered.
 2. Form chamfers with 3/4" x 3/4" strips, unless otherwise shown, accurately formed and surfaced to produce uniformly straight lines and tight edge joints. Extend terminal edges to required limit and miter chamfer strips at changes in direction.
 3. Concealed corners may be formed either square or chamfered.
- D. Provision for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Size and location of openings, recesses and chases are the responsibility of the trade requiring such items. Accurately place and securely support items built into forms. Openings for doors and windows shall be formed with a tolerance of minus 0" and plus 1/2" from indicated dimensions.
- E. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is to be placed. Retighten forms immediately after concrete placement as required to eliminate mortar leaks.
- F. Earth Forms:
1. Construct wood edge strips at top sides of excavations.
 2. Provide forms for footings wherever concrete cannot be placed against solid earth excavation.
 3. Remove loose dirt and debris prior to concrete pours.
 4. Foundation concrete may be placed directly into neat excavations provided the foundation trench walls are stable as determined by the Geotechnical Engineer.
 - (a) The horizontal dimensions of unformed concrete footings shall be increased 1 inch at every surface at which concrete is placed directly against the soil.
 - (b) The minimum formwork shown on the drawings is mandatory to ensure clean excavations immediately prior to and during the placing of concrete.
- G. Footings and Grade Beams:
1. Provide forms for footings and grade beams if soil or other conditions are such that earth trench forms are unsuitable.
- H. For slabs-on-grade, secure edge forms in such a manner as to not move under weight of construction loads, construction and finishing equipment, or workers

3.3 INSTALLATION OF EMBEDDED ITEMS

- A. General: Set and build into the work anchorage devices and other embedded items required for other work that is attached to, or supported by, concrete. Use top and bottom templates, setting drawings, diagrams, instructions and directions provided by suppliers of the items to be attached thereto.
- B. Coordinate and schedule the work of this Section with the work of other Sections required to be set in, on, or contiguous with forms.
- C. Anchor bolts out of position or plumb by more than 1/4" shall be reinstalled in correct position and plumb at no increase in Contract Price.

3.4 REMOVAL OF FORMS

- A. Remove forms completely. Exposed surfaces of concrete shall be clean, smooth and free of irregularities. Secure the Architect's approval for time and sequence of form removal.
- B. Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50°F (10°C) for 12 hours after placing concrete, provided concrete is sufficiently hard to avoid damage by form-removal operations, and provided curing and protection operations are maintained after removal of formwork.
- C. Formwork supporting weight of concrete, such as beam soffits, joists, slabs, and other structural elements, may not be removed until concrete has attained at least 75% of design compressive strength as proven by cylinder test . If stripping occurs before [3] days, 100% strength must be achieved.
 - 1. Results of the cylinder break shall be presented to the Architect to demonstrate compliance with above specified strength requirements prior to form removal.
 - 2. Provide reshores as required per ACI 347.
 - 3. Determine potential compressive strength of in-place concrete by testing field-cured specimens representative of concrete location or members
- D. Remove formwork progressively using methods to prevent shock loads or unbalanced loads from being imposed on structure. Forms shall be removed without damage to the concrete. Comply with ACI 347.
- E. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against concrete surfaces.
- F. Reshore structural members where required due to design requirements, construction requirements, or construction conditions.
 - 1. Reshore on same day shoring and forms are removed.
- G. Whenever formwork is removed during the curing period, the exposed concrete shall be cured per requirements of Section 03 30 00.
- H. All wood formwork, including that used in void spaces, pockets and other similar places shall be removed.
- I. Form tie holes shall be filled as per approved samples submitted to the Architect and Engineer.
- J. The Contractor shall assume responsibility for all damage due to removal of the forms.

END OF SECTION

SECTION 03 20 00

CONCRETE REINFORCEMENT

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Reinforcing steel bars for cast-in-place concrete, complete with tie wire.
- B. Support chairs, bolsters, bars supports, spacers, and other accessories for reinforcing.

1.2 RELATED SECTIONS

- A. Section 03 10 00: Concrete Formwork.
- B. Section 03 30 00: Cast-in-Place Concrete.

1.3 QUALITY ASSURANCE

- A. Perform concrete reinforcing work in accordance with CRSI 63 and 65 and ACI 301, 315 and 318, unless specified otherwise in this Section.
- B. The Owner's Testing Agency will:
 - 1. Provide tests in accordance with the California Building Code (CBC) Section 1913A.2.
 - 2. Collect mill test reports for reinforcement.
 - 3. Take samples from bundles at fabricators:
 - (a) When bundles are identified by the heat number and accompanied by mill analysis, two specimens shall be taken from each ten (10) tons, or fraction thereof, of each size and grade.
 - (b) When reinforcement is not positively identified by the heat numbers or when random sampling is intended, two specimens shall be taken from each 2-1/2 tons, or thereof, of each size and grade.
 - (c) All costs associated with the test of reinforcing that not have mill test reports will be at the contractor's expense.
 - 4. Test for tensile and bending strengths.

1.4 REFERENCES

- A. California Code of Regulations. Title 24, 2016 edition, also known as California Building Code (CBC).
- B. ACI 301 - American Concrete Institute - Specification for Structural Concrete for Buildings.
- C. ACI 315 - American Concrete Institute - Details and Detailing of Concrete Reinforcement.
- D. ACI 318 - Building Code Requirements for Reinforced Concrete.
- E. CRSI 63 - Recommended Practice for Placing Reinforcing Bars.
- F. CRSI 65 - Recommended Practice for Placing Bar Supports, Specifications and Nomenclature.

1.5 SUBMITTALS

- A. Submit shop drawings including appropriate plans and details. Indicate bar sizes, spacings, locations, and quantities of reinforcing steel, bending and cutting schedules, and supporting and spacing device.

2. PART 2 PRODUCTS

2.1 REINFORCING

- A. Reinforcing Steel: 60 ksi yield grade; deformed type as indicated on drawings.
 - 1. Bars: Billet steel, ASTM 615; as indicated.
 - 2. Finish: Plain unless indicated galvanized on drawings or so specified.

2.2 ACCESSORY MATERIALS

- A. Tie Wire: Minimum 16-gage annealed type, or patented system accepted by Architect.
- B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcing during construction conditions.

2.3 FABRICATION

- A. Fabricate concrete reinforcing in accordance with ACI 315.
- B. Locate reinforcing splices, not indicated on drawings, at points of minimum stress. Location of splices shall be reviewed by Architect.

3. PART 3 EXECUTION

3.1 PLACEMENT

- A. Place reinforcing supported and secured against displacement. Do not deviate from true alignment.
- B. Place reinforcing to obtain at least minimum coverages for concrete protection. Arrange, space and securely tie bars and bar supports to hold reinforcing in position during concrete placement operations.
- C. Before placing concrete, ensure reinforcing is clean, free of loose scale, dirt, or other foreign coatings, which would reduce bond to concrete.

3.2 FIELD QUALITY CONTROL

- A. General: The Owner's Testing Laboratory shall test and inspect concrete reinforcement and embedded assemblies as Work progresses. Failure to detect any defective work or material shall not in any way prevent later rejection when such defect is discovered nor shall it obligate the Design Professionals for final acceptance.
- B. Owner's Testing Laboratory shall provide qualified personnel at site to inspect reinforcement and embeds using the latest Drawings and reviewed shop drawings, as follows:
 - 1. Prior to placement, inspect reinforcement and embeds for grade, quality of material, absence of foreign matter, and for suitable storage.
 - 2. Provide continuous inspection of reinforcement and embedded assemblies during placement and immediately prior to concreting operations for: size, quantity, vertical and horizontal spacing and location, correctness of bends and splices, mechanical splices, clearances, compliance with specified tolerances, security of supports and ties, concrete cover, and absence of foreign matter.
 - 3. Inspect epoxy-coated reinforcement for coating damage and required applied coatings.
- C. Owner's Testing Laboratory shall submit inspection, observation, and/or test reports to the Design Professionals as required herein and shall provide an evaluation statement in each report stating whether or not concrete reinforcement and embedded assemblies conforms to requirements of Specifications and Drawings and shall specifically note deviations there from.
- D. Immediately report deficiencies to the Contractor. Contractor shall prepare proposed remedy for deficiency. Contractor shall present proposal to the Design Professionals for approval. After an approved proposal is accepted by the Design Professionals, the Contractor shall correct the deficiency at no cost to the Owner.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cast-in-place concrete footings, foundations and grade beams.
- B. Cast-in-place walls.
- C. Floors and slabs on grade.
- D. Cast-in-place equipment pads.
- E. Surface finish of floors and walls.
- F. Preparation of concrete base slabs to receive toppings.

1.2 RELATED WORK

- A. Section 03 10 00: Concrete Formwork.
- B. Section 03 20 00: Concrete Reinforcement.
- C. Divisions 15 and 16: Mechanical and electrical items to be cast in concrete.

1.3 QUALITY ASSURANCE

- A. Perform cast-in-place concrete work in accordance with ACI 318, unless specified otherwise in this Section.
- B. Inspection and testing will be performed by owner's testing laboratory.

1.4 SUBMITTALS

- A. Submit in accordance with Section 01 33 00: Submittal Procedures.
- B. Submit proposed mix design of each class of concrete to inspection and testing firm and Architect and Engineer for review prior to commencement of work.
- C. Three concrete test cylinders will be taken not less than once for every 50 cubic yards of concrete placed or not less than once a day for each class of concrete placed by special inspector.
- D. The cement supplier shall submit certification of compliance in accordance with CBC Section 1913A.1.
- E. One additional test cylinder will be taken during cold weather concreting, and be cured on job site under same conditions as concrete it represents.
- F. One slump test will be taken for each set of test cylinders taken.
- G. The manufacturer of transit-mix concrete shall deliver to job inspector a certificate with each mixer truck. Certificate shall bear signature of representative of Testing Laboratory, stating quantity of cement, water, fine aggregate, coarse aggregate, and admixtures contained in load. Certificates shall indicate time, to the nearest minute, that batch was mixed.

1.5 REFERENCES

- A. American Concrete Institute (ACI):
 - 1. ACI 318 - Building Code Requirements for Reinforced Concrete
 - 2. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing concrete.
 - 3. ACI 301 - Specifications for Structural Concrete for Buildings.

4. ACI 305 - Hot Weather Concreting.
 5. ACI 306 - Cold Weather Concreting.
- B. All work shall be done in accordance with California Code of Regulations. Title 24, 2019 edition, also known as California Building Code (CBC).

2. PART 2 PRODUCTS

2.1 CONCRETE MATERIALS

- A. Cement: Portland, Type II; ASTM C150. Gray, except where noted, supplement with the following:
1. Fly Ash: 25 percent maximum; Fly Ash shall conform to ASTM C618 Class N or F.
 2. Combined Fly Ash and Pozzolan: 25 percent maximum
 3. Ground Granulated Blast Furnace Slag: 50 percent maximum
 4. Combined Fly Ash or Pozzolan and Ground Granulated Blast Furnace Slag: 50 percent maximum with combined Fly Ash and Pozzolans not exceeding 25 percent
- B. Fine and Coarse Aggregates: ASTM C33 for normal weight concrete. Aggregate shall be from established sources with proven history of successful use in producing concrete with minimum shrinkage. The average drying shrinkage after 28 days shall not exceed 0.045 percent for hardrock concrete.
- C. Water: Clean, and free from injurious amounts of oil, alkali, organic matter, or other deleterious material.
- D. Source of aggregate shall remain constant for the duration of the work, as practical.

2.2 ADMIXTURES

- A. Air Entrainment: ASTM C260.
- B. Water-Reducing Admixture: ASTM C494, Type A, and containing not more than 0.1 percent chloride ions.
- C. Water-Reducing, Retarding Admixture: ASTM C494, Type D, and containing not more than 0.1 percent chloride ions.
- D. Pozzolan: ASTM A618, containing not more than 0.1 percent chloride ions.
- E. Calcium Chloride: Not permitted.
- F. ASTM C 494, Type C, 30% + 2% solution of Calcium Nitrite

2.3 ACCESSORIES

- A. Bonding Agent: "Anvil Bond" as manufactured by Master Builders or approved equal.
- B. Non-Shrink Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2400 psi in two days and 6000 psi in 28 days.
- C. Absorptive Mats: Cotton fabric or burlap-polyethylene, minimum 8oz./sq. yd; bonded to prevent separation during handling, placement and curing.
- D. Liquid Membrane-Forming curing Compound: Conforming to ASTM C309, Type I, and which will not discolor concrete or affect bonding or other finish applied thereover, and which restricts loss of water to not more than 0.500 grams per sq. cm. of surface when tested per ASTM C156.
- E. Provide Fly Ash or other reclaimed cementitious materials as indicated in Section 2.01.A.
- F. Slab-Leveling Compound. Provide leveling compound where required to meet floor flatness and levelness requirements. Acceptable products include Ardex SD-L, Burke 300 Durock or approved equal.

2.4 PROPORTIONING AND DESIGN OF MIXES

- A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method used, use an independent testing facility acceptable to Engineer and Architect for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing unless otherwise acceptable to Architect.
- B. Except as otherwise specified, submit written reports to Architect and Engineer of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed by Architect and Engineer.
- C. Unless lower limits are stated in the contract documents, all concrete exposed to freezing and thawing in moist condition and/or required to be watertight or used in slabs-on-grade shall have a maximum W/cm ratio of 0.45.
- D. Provide concrete of following strength:
 - 1. Compressive strength (28 day) shall be as shown on Structural Drawings.
 - 2. Select proportions for normal weight concrete in accordance with ACI 301 by Method 1, 2 or 3 as applicable. Add air-entraining agent to concrete to entrain air as indicated in ACI 301.
- E. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, water, test results, or other circumstances warrant; at no additional cost to Owner and as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by architect before using in work.
- F. Admixtures:
 - 1. Use water-reducing admixture or high-range, water-reducing admixture (super plasticizer), may be used in concrete subject to approval by Architect.
 - 2. Use accelerating admixture in concrete slabs placed at ambient temperatures below 50 degrees F (10 degrees C).
 - 3. Use air-entraining admixture in exterior exposed concrete, unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having air content of 4 percent to 6 percent.

2.5 CONCRETE MIXES

- A. Ready-Mix Concrete: All concrete shall be ready-mix concrete unless otherwise approved by the Engineer and Architect.
- B. Self-Leveling Concrete Topping - Underlayment for Interior Applications:
 - 1. Topping for epoxy terrazzo flooring application shall include latex modifier, such as "TERA-GEM III, Revocoat Latex #1 Additive". Follow manufacturer's recommendations and flooring installation requirements.
 - 2. Use self-leveling underlayment concrete formulated to level concrete floors without shrinking, cracking or spalling, and capable of being placed from feathered edge to 1" thickness without aggregate in one pour. If greater than 1" thickness is required, aggregate shall be used in accordance with manufacturer's requirements. Appropriate primer shall be utilized for all underlayment applications.
 - 3. Example acceptable product: Ardex Engineered Cements "ARDEX K-15"
 - 4. Example acceptable product: Euclid Chemical's "Flo-Top or Super Flo-Top"
 - 5. Example acceptable product: Sika Corporation "Sika Level Series"
 - 6. Example acceptable product: BASF "MasterTop 110SL"

3. PART 3 EXECUTION

3.1 PLACING CONCRETE

- A. Pre-placement Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood forms immediately before placing concrete where form coatings are not used.
- B. Place concrete in accordance with ACI 304, and as herein specified.
- C. Notify Structural Engineer minimum 48 hours prior to placing of concrete.
- D. Ensure anchors, seats, plates, and other items to be cast into concrete are placed, held securely, and will not cause problems in placing concrete. Rectify misplacements and proceed with work.
- E. Maintain records of poured concrete items. Record date, location of pour, quantity, air temperature and test samples taken.
- F. Ensure reinforcement, embedded parts, formed expansion and contraction joints, and other inserts are not disturbed during concrete placement.
- G. Prepare previously placed concrete by blowing joints and provide keyway.
- H. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified only with prior approval of the Architect. Deposit concrete as nearly as practicable to this final location to avoid aggregation.
- I. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 24 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
- J. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI recommended practices.
- K. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.
- L. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
- M. Bring slab surfaces to correct level with straight-edge and strike off. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
- N. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Engineer and Architect immediately on discovery.
- O. Conform to ACI 305 when concreting during hot weather.
- P. Conform to ACI 306 when concreting during cold weather.
- Q. Unless otherwise permitted, time for completion of discharge shall comply with ASTM C94/C94M. When discharge is permitted after more than 90 minutes have elapsed since batching or after the drum has revolved 300 revolutions, verify that air content of air-entrained concrete, slump, and temperature of concrete are as specified. When discharge is permitted after more than 90 minutes have elapsed since batching or after the drum has revolved 300 revolutions, no water may be added.

3.2 FINISH OF FORMED SURFACES

- A. Rough Form Finish: For all formed concrete surfaces except as noted below. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projects exceeding 1/4" in height rubbed down or chipped off.
- B. Smooth Form Finish: For formed concrete surfaced exposed-to-view or to be covered with a material such as waterproofing that requires a smooth surface. This is as cast arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas, with fins or other projects completely removed and smoothed.

3.3 MONOLITHIC SLAB FINISHES

- A. General: finish slab surfaces in accordance with one of the finishes noted below, as designated in the Contract Documents. Finish all joints and edges with proper tools as approved.
- B. Placement: Place concrete at rate that allows spreading, straight-edging, and darbying or bull floating before bleed water appears. Screed all slabs, topping fills to true levels and slopes. Work surfaces as required to produce specified finish. Do no finishing in areas where water has accumulated; drain and re-screed. In no case use a sprinkling of cement and sand to absorb moisture.
- C. Tolerances: Measure slabs-on-grade to verify compliance with the tolerance requirements of ASTM E 1155 and ACI 117. Measure floor finish tolerances within 72 hours after slab finishing and before removed of supporting formwork or shoring.
 - 1. Concrete slab flatness and levelness tolerances to meet ACI 117, Section 4.5.6.
 - (a) Minimum requirements at slab-on-ground: Flatness overall min Ff = 20 and levelness overall min FI = 17.
- D. Scratch Finish:
 - 1. Apply scratch finish to monolithic slab surfaces that are to receive mortar setting beds for tile, where mortar set tile is indicated on drawings.
 - 2. After placing slabs, plane surface to a tolerance not exceeding 1/4" in 10' when tested with a 10' straightedge. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set, with staff brushes, brooms, or rakes.
- E. Float Finish:
 - 1. Apply float finish to monolithic slab surfaces scheduled to receive trowel finish and other finishes as hereinafter specified.
 - 2. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Check and level surface plane to a tolerance not exceeding 1/4" in 10' when tested with a 10' straightedge. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, re-float surfaces to a uniform, smooth, granular texture.
- F. Trowel Finish:
 - 1. Unless otherwise noted, apply trowel finish to monolithic slab surfaces to be left exposed-to-view, or scheduled to receive floor finishes other than setting bed types.
 - 2. After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and with a surface plane tolerance not exceeding those called out above in section C. Grind smooth surface defects, which would telegraph through applied floor covering system.

- G. Non-Slip Broom Finish:
1. Apply non-slip broom finish to exterior concrete platforms, steps and ramps, and elsewhere as indicated.
 2. Immediately after trowel finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.4 CONCRETE CURING AND PROTECTION

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
1. Start curing procedures as soon as free water has disappeared from concrete surface after placing and finishing.
 2. Continue curing as directed by Architect and in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.
- B. Curing Methods: Perform curing of concrete by either moist curing, by moisture retaining cover curing, membrane curing, or by combinations thereof, as herein specified.
1. Provide moisture curing by following methods:
 - (a) Keep concrete surface continuously wet by covering with water.
 - (b) Continuous water-fog spray.
 - (c) Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4-inch lap over adjacent absorptive covers.
 2. Provide moisture-cover curing as follows: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed at widest practicable width with sides and ends lapped at least 3 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 3. Provide liquid membrane curing as follows:
 - (a) Apply the specified membrane-forming curing compound to damp concrete surfaces as soon as possible after final finishing operations are complete, but not later than 2 hours. Apply uniformly in a continuous operation by power spray equipment or roller equipment in accordance with the manufacturer's directions. Recoat areas that are subjected to heavy rainfall within three hours after initial application. Maintain the continuity of the coating and repair damage to the coat during the entire curing period.
 - (b) Verify compatibility of membrane curing compounds on surfaces that are to be covered with a coating material applied directly to the concrete or with a covering material bonded to the concrete, such as other concrete, liquid floor hardener, waterproofing, dampproofing, membrane roofing, flooring, painting, and other coatings and finish materials, unless otherwise acceptable to the Architect.
 - (c) Do not use curing compounds that will diminish bond of subsequent materials.
 4. Curing Formed surfaces: Cure formed concrete surfaces, including walls with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.
 5. Curing Unformed surfaces: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by any of the methods specified herein, as applicable.

3.5 PATCHING

- A. Allow Architect/Structural Engineer to inspect concrete surfaces immediately upon removal of forms. Patch imperfections as directed.

3.6 FIELD QUALITY CONTROL

- A. Contractors Testing Laboratory: As specified in Article 1.03 above.

3.7 DEFECTIVE CONCRETE

- A. Modify or replace concrete not conforming to required lines, details, and elevations.
- B. Repair or replace concrete not properly placed resulting in excessive honeycombing and other defects. Patch, fill, touch up, repair, or replace exposed architectural concrete for each individual area in accordance with Architect's particular directions.

END OF SECTION

SECTION 06 10 00

ROUGH CARPENTRY

1. PART 1 GENERAL

1.1 DESCRIPTION

- A. Section Includes: Provision of all lumber framing, rough hardware, blocking and backing as indicated in the contract drawings.

1.2 REFERENCES

- A. Requirements of GENERAL CONDITIONS and DIVISION NO. 1 apply to all Work in this Section.
- B. The following published specifications, standards, tests, or recommended methods of trade, industry, or governmental organizations apply to Work in this Section (latest editions apply).
 - 1. California Code of Regulations. Title 24, 2019 edition, also known as California Building Code (CBC).
 - 2. (APA) - American Plywood Association, "Guide to Plywood Grades."
 - 3. (PS) - United States Product Standard, PS-1 and PS-2 "Construction and Industrial Plywood."
 - 4. (UL) - Underwriters' Laboratories, Inc., "Fire Hazard Classification, FR-S."
 - 5. (WCLIB) - West Coast Lumber Inspection Bureau, "Standard Grading Rules No. 17."
 - 6. (WWPA) - Western Wood Products Association, "Grading Rules for Lumber."
 - 7. (AWPA) - American Wood Preservers Association Standards.
 - (a) T1 – "Processing and Treatment Standard"
 - (b) U1 – "User Specification for Treated Wood"
 - 8. (AF&PA) - American Forest and Paper Association, "National Design Specification for Wood Construction." "Special Design Provisions for Wood & Seismic."
 - 9. (ASTM) - American Society of Testing and Materials.

1.3 SUBMITTALS

- A. Shop Drawings of all specially fabricated rough hardware.
- B. Certification: Provide lumber with each piece factory-marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mil.
- C. Samples as requested by the architect.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Provide proper facilities for handling and storage of materials to prevent damage to edges, ends, and surfaces.
- B. Keep materials under cover and dry. Protect against exposure to moisture and contact with damp or wet surfaces. Where necessary, stack materials off ground on level flat forms, fully protected from weather.

1.5 JOB CONDITIONS

- A. Environmental Requirements: Maintain uniform moisture content of lumber at not more than 19-percent during and after installation.

- B. New lumber adjacent and connected to existing lumber shall have a moisture content of not more than 15 percent at the time of installation.
- C. Sequencing, Scheduling: Coordinate details with other Work supporting, adjoining or fastening to rough carpentry Work.

2. PART 2 PRODUCTS

2.1 MATERIAL

A. Rough Carpentry:

- 1. Sills on Concrete: Douglas Fir with Preservative Treatment.
- 2. Lumber (Wood Framing): Meet requirements of following minimum grades.

<u>Item</u>	
Studs	D.F. No. 1
Plates	D.F. No. 1
Beams	D.F. No. 1
Joists	D.F. No. 1
Posts	D.F. No. 1
Blocking	D.F. No. 2
- 3. Plywood: Provide thickness, grade, and panel identification index shown on drawings. For plywood thickness 5/32 or greater provide a minimum of 5 ply.

B. Rough Hardware: All exterior hardware shall be hot-dipped galvanized.

- 1. Nails: Common wire per ASTM F1667, typical; hot-dipped zinc-coated galvanized, stainless steel, silicon bronze, or copper at exposed conditions, fire-retardant-treated, and preservative-treated lumber.
- 2. Expansion Bolts: Reverse cone, self-wedging, expansion type, Tightening of nut or increased tension on bolt shank shall act to force wedges outward to create positive increased resistance to withdrawal, Simpson Strong-Bolt, Hilti Kwik-Bolt TZ, or equal product substituted per Section 01 63 00.
- 3. Metal Framing Connectors: Fabricate from hot-dipped galvanized steel (G90 coating). Connectors in contact with preservative-treated lumber shall have G185 hot dipped galvanized coating per ASTM A653. Connectors in contact with fire-treated lumber or are in high corrosive environments shall be manufactured with Type 316L stainless steel. Connectors shall be at least 16-gauge material, 1/8-inch plate materials where welded, unless otherwise shown or specified, punched for nailing. Nails and nailing shall conform to the manufacturer's instructions, including coating and material where applicable, with a nail provided for each punched nail hole. Use maximum nail size listed by manufacturer. Manufactured by Simpson Company or equal product substituted per Section 01 63 00.
- 4. Miscellaneous Hardware: Provide all common screws, bolts, fastenings, washers and nuts required to complete rough carpentry Work.
- 5. Bolts and sill bolts in wood shall be ASTM A307 with standard cut threads; full diameter bolts (no rolled or "upset" threads permitted) per ANSI/ASME standard B18.2.1.
- 6. Fasteners used for attachment of exterior wall coverings shall be hot-dipped zinc-coated galvanized steel, mechanically deposited zinc-coated steel, stainless steel, silicon bronze, or copper. The coating weights for hot-dipped zinc-coated fasteners shall be in accordance with ASTM A153. The coating weights for mechanically deposited zinc-coated fasteners shall be in accordance with ASTM B695, Class 55 minimum.

2.2 TREATMENTS

- A. Fire-Retardant Treatment: Furnish in accordance with AWPA Standards T1, U1, and P17, "Fire Retardant Formulations."
- B. Preservative Treatment: Furnish in accordance with AWPA Standards T1 and U1. Preservatives with an ammonia base, including Ammoniacal Copper Zinc Arsenate (ACZA) are not permitted.

2.3 FABRICATION

- A. Preparation:
 - 1. Verify measurements at job site.
 - 2. Verify details and dimensions of equipment and fixtures integral with finish carpentry for proper fit and accurate alignment.
 - 3. Coordinate details with other work supporting, adjoining, or fastening to casework.
- B. Lumber:
 - 1. Air- or kiln-dry to maximum 19-percent moisture content at time of surfacing.
 - 2. Furnish surfaced four sides, S4S, unless otherwise noted.
 - 3. Size to conform with rules of governing standard. Sizes shown are nominal unless otherwise noted.
- C. Wood Treatments:
 - 1. Fire-Retardant Treatment:
 - (a) Treat in accordance with AWPA Standards T1 and U1 and approved manufacturer's recommendations. Verify AWPA Use Category with proposed application prior to selected preservative. Fire treated lumber shall conform to the requirements of CBC Section 2303.2.
 - 2. Preservative Treatment:
 - (a) Treat lumber and plywood sheathing that is:
 - (1) In contact with concrete and masonry less than six feet above the ground.
 - (2) Exposed to weather permanently.
 - (3) Where specified in the Contract Documents.
 - (b) Treat in accordance with AWPA Standards T1 and U1. Verify AWPA Use Category with proposed application prior to selecting preservative.
 - (c) Treated lumber shall be marked per CBC Section 2303.1.8.1.
 - (d) After Treatment and prior to shipping, air- or kiln-dry lumber to maximum 19-percent moisture content.

2.4 SOURCE QUALITY CONTROL

- A. Lumber shall bear grade-trademark or be accompanied by certificate of compliance of appropriate grading agency.
- B. Plywood shall bear APA grade-trademark.

3. PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive rough carpentry Work and verify following:
 - 1. Completion of installation of building components to receive rough carpentry Work.
 - 2. That surfaces are satisfactory to receive Work.
 - 3. That spacing, direction, and details of supports are correct to accommodate installation of blocking, backing, stripping, furring and nailers.
 - 4. That all anchor bolts and holdown bolts are properly installed.

3.2 INSTALLATION

- A. Cutting: Perform all cutting, boring, and similar Work required.
- B. Selection of lumber pieces:
 - 1. Carefully select all members. Select individual pieces so that knots and defects will not interfere with placement of bolts, with nailing or making connections.
 - 2. Cut-out and discard pieces with defects that make the piece unable to serve its intended function. The Architect may reject lumber, whether or not it has been installed, for excessive warp, twist, bow, crook, mildew, fungus or mold as well as for improper cutting or fitting.
 - 3. Shimming: Do not shim sills, joists, short studs, trimmers, headers, lintels and other framing members unless specifically detailed in drawings.
- C. Drill holes in pieces where splitting may occur.
 - 1. Remove split lumber and replace with new members.
 - 2. Fasten framing anchors and steel bridging with galvanized special nails furnished with hardware in every nail hole, except where noted to be welded to structural steel supports in which case comply with AWS requirements.
- D. Studs, Joists, Beams, and Posts: Install all members true to line. No wood shingle shims are permitted. Place joists with crown up; maximum 1/4-inch crown permitted.
- E. Nail joints in accordance with applicable requirements of the CBC Table 2304.9.1 unless otherwise shown or specified. Predrill where nails tend to split wood. Nails into preservative-treated lumber shall be hot-dipped galvanized.
- F. Bolt holes to be 1/16-inch oversize. Threads shall not bear on wood. Use standard malleable iron washers against wood. Carriage bolts require washers under the nut only.
- G. Provide blocking, grounds, nailers, stripping, and backing as shown and as required to secure other Work.
- H. Adjoining sheathing panel edges shall bear and be attached to the framing members. Nails shall be placed not less than 3/8-inch from the panel edge.
- I. Plywood flooring shall be field glued with adhesive meeting APA specification AFG-01 applied in accordance with the manufacturer's recommendations. Apply continuous line of glue on joists and in groove of tongue and groove panels.
- J. Protect preservative-treated and fire-treated lumber per APWA Standard M4, "Standard for the Care of Preservative-Treated Wood Products."
- K. Where wood is cut, sawed, planed, bored or marred after preservative or fire-retardant treatment, apply two heavy brush coats of same material used in treatment.

- L. Nail heads shall be driven flush with plywood surface. Overdriven nails (nails which fracture the outer ply layer) shall be replaced one for one.
- M. Screws (Wood or Lag): Screws shall be screwed and not driven into place. Screw holes for the unthreaded portion shall be predrilled to the same diameter and depth of shank. Holes for threaded portion shall be predrilled less than or equal to the diameter of the root of the thread. Provide standard cut washers under head of lag screws.
- N. Sheathing used for diaphragms and shear walls that are part of the seismic-force-resisting system shall be applied directly to framing members. Sheathing is permitted to be fastened over solid limber planking or laminated decking, provided the sheathing panel joints do not align with the planking or decking joints.

3.3 CLEANING AND ADJUSTING EXPOSED TIMBER

- A. Remove damaged or otherwise disfigured portions and replace with new prior to the Owner's acceptance.
- B. Wash finished Work in strict accordance with product manufacturer's directions and ensure that washed surfaces do not differ from clean unwashed surfaces. Any difference will be considered unsatisfactory work.

3.4 FIELD QUALITY CONTROL

- A. The Owner's Testing Agency shall:
 - 1. Inspect erected timber framing as required to establish conformity of work with Drawings.
 - 2. Inspect all timber connectors per CBC Section 1704A.5.3.
 - 3. Inspect high-load diaphragm nailing and support framing per CBC Section 1704A.5.1.
 - 4. Inspect elements of the seismic lateral force resisting system per CBC Section 1705A.11.
 - (a) Inspect floor and roof diaphragm nailing for nail size, spacing and penetration at plywood panel edges, and special nailing at collector and drag members.
 - (b) Inspect shear wall nailing for nail size, spacing, edge distance and penetration at plywood panel edges, and nailing at holddown posts.
 - (c) Inspect all bolted connections of elements that are part of the seismic lateral force resisting system.
 - (d) Inspect holddown bolts into wood and concrete.
- B. Machine Nailing: Use of machine nailing is subject to a satisfactory jobsite demonstration for each project and the approval of the Project Inspector and the Structural Engineer. The approval is subject to continued satisfactory performance. If the nail heads penetrate the outer ply more than would be normal for a hand-held hammer, or if minimum allowable edge distances are not maintained, the performance will be deemed unsatisfactory and machine nailing shall be discontinued.

3.5 CLEAN-UP

- A. Dispose of pressure-treated wood in an authorized disposal area. DO NOT BURN TREATED WOOD. Do not bury wood of any type on the jobsite.

END OF SECTION

SECTION 06 41 16

PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Special fabricated cabinet units.
- B. Countertops.
- C. Preparation for utilities.
- D. Cabinet hardware.
- E. Glass for cabinet units.

1.2 REFERENCES

- A. WI - Woodwork Institute of California: North American Architectural Woodwork Standards 3.1. (NAAWS)
- B. ASTM A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- C. ASTM A653 - Steel Sheet, Zinc Coated, (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- D. ASTM A924 - General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
- E. ASTM C615 – Standard Specification for Granite Dimension Stone.
- F. ASTM E84 – Test Method for Surface Burning Characteristics of Building Materials.
- G. CBC – California Building Code, (CCR) California Code of Regulations, Title 24, Part 2.
- H. FSC – Forest Stewardship Council.

1.3 QUALITY ASSURANCE - MONITORED COMPLIANCE PROGRAM

- A. Manufacture casework items in accordance with quality standards of the North American Architectural Woodwork Standards of the Woodwork Institute.
- B. All millwork and the installation of millwork shall be monitored for compliance under the scope of the WI Monitored Compliance Program (MCP).
- C. Fees charged by the Woodwork Institute for their monitored compliance service are the responsibility of the casework manufacturer.
- D. Provide WI Inspection Service at the millwork fabricator. Provide to Architect a written report showing the results of the inspection.
- E. Provide WI Certified Compliance Labels on all items of casework and countertops.
- F. Provide WI Inspection Service at the job site. Provide to Architect a written report showing the results of the inspection.
- G. Self Certification by the millwork fabricator or inspection by other than an authorized representative of The Woodwork Institute is not acceptable.
- H. Upon completion of the installation, provide a WI Monitored Compliance Certificate.

1.4 QUALITY ASSURANCE - CERTIFIED SEISMIC INSTALLATION PROGRAM

- A. Install casework items in accordance with the Woodwork Institute's Certified Seismic Installation Program (CSIP)

1.5 REGULATORY REQUIREMENTS

- A. Conform to CBC requirements for flame spread classification in accordance with CBC Section 803 and Table 803.11.
- B. Conform to Flame Spread Classifications for Interior Millwork for flame spread ratings as tested according to ASTM E84.
- C. Materials of this section shall meet the requirements for formaldehyde as specified in the California Air Resources Board's Air Toxics Control Measure (ATCM) for Composite Wood (17CCR 93120 et seq.).

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and protect products to site under provisions of Section 01 61 00.
- B. Conform to Section 2 of the North American Architectural Woodwork Standards for a climate controlled application.
- C. Delivery of casework shall be made only when the area of installation is enclosed, all plaster and concrete work is dry, the area is broom clean and environmental conditions are as specified.

1.7 ENVIRONMENTAL CONDITIONS

- A. Area of casework installation shall be fully enclosed, well ventilated, and protected from direct sunlight, excessive heat, rain and moisture.
- B. Relative humidity of the area of casework installation shall be maintained between 25 percent and 55 percent with a temperature range of between 60 degrees F to 90 degrees F.
- C. Casework shall be acclimated to the area of installation for a minimum of 72 hours prior to installation.

1.8 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 01 33 00.
- B. Include materials, component profiles, fastening methods, assembly methods, joint details, accessory listings, and schedule of finishes.
- C. Provide WI Certified Compliance Label for the Certified Seismic Installation Program on the first page of shop drawings.
- D. Provide WI Certified Compliance label on first page of shop drawings. Include WI inspector's signature.

1.9 WARRANTY

- A. Provide manufacturer's 10 year warranty for solid surface countertops and sinks under provisions of Section 01 77 00.
- B. Warranty to provide for repair or replacement of countertop material and sinks if material fails due to manufacturing defect.

2. PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Active member of the Woodwork Institute licensed by WI to provide WI Certified Compliance Certificates and Labels for the products and materials specified in this section www.woodworkinstitute.com.

2.2 MATERIALS

- A. Material shall conform to standards of the North American Architectural Woodwork Standards as follows: Section 3, Section 4, Section 10, and Section 11.
- B. Materials: FSC - Forest Stewardship Council certified sustainable harvested wood.

2.3 CABINET DESIGN

- A. Individual cabinets are indicated on the drawings by the WI Cabinet Design Series (CDS) numbering system, Design Ideas.

2.4 MODULAR CASEWORK - LAMINATED PLASTIC COVERED

- A. Fabricate in accordance with Section 10 of the North American Architectural Woodwork Standards.
 - 1. WI Grade: Custom
 - 2. Core Material: Combination Core
 - 3. Construction: Style - Frameless
 - 4. Joinery: Doweled Joints
 - 5. Cabinet Backs: Blind Dadoed.
 - 6. Cabinet Door Type: Flush overlay.
 - 7. Base: Moisture resistant.
 - 8. Shelves: 1-M-2 particle board, with HPDL two sides, 1 inch thick, capable of supporting 50 lb/sq ft load with deflection of L/144.
 - 9. Shelf Edge Bands: 1mm PVC in color to match shelf. All 4 edges of adjustable shelves to receive banding.
 - 10. Door and Drawer Edge Bands: 3mm PVC radiused 1/8 inch at edge. Solid color as selected by Architect.
 - 11. Exposed Surfaces (Including shelves and interior of open front cabinets): 0.028 inch high pressure plastic laminate, color and pattern as selected by Architect. A maximum of 5 colors and patterns to be selected. A minimum of 3 color combinations per room may be selected.
 - 12. Semi-Exposed Surfaces (Behind doors and inside drawers): Low pressure decorative polyester or melamine laminate 0.020 inch thick in complimentary color to exposed surfaces as selected.
 - 13. Security and Dust Panels: Particle board, 3/4 inch
 - 14. Substitutions: Under the provisions of Section 01 25 13.

2.5 LAMINATED PLASTIC COUNTERTOPS

- A. Fabricate in accordance with Section 11 of the North American Architectural Woodwork Standards.
 - 1. WI Grade: Premium.
 - 2. Core Thickness: 0.75 inch minimum.
 - 3. Laminate Thickness: 0.060 inch colorcore or solicolor.
 - 4. Front Edge Covering: Waterfall, no-drip.
 - 5. Backsplash at Top: Integral Coved. 4 inch height.
 - 6. Top of Back Splash: Waterfall with scribe.
 - 7. Construction Type: Assembly 2, deck mount, manufacturer assembled.
 - 8. Plastic Colors and Pattern: To be selected from solid colors woodgrain pattern textured finish.

2.6 HARDWARE

- A. Finish: Satin Aluminum.
- B. Shelf Supports: Metal or molded polycarbonate clips set in drilled holes spaced 32 mm on center. Clips to have vertical locating pin for retention of shelf.
- C. Drawer and Door Pulls: Epcos MC-402-4 U-shaped wire pull.
- D. Cabinet Locks: Olympus 500/600 or CompXNational 8173/8178.
- E. Drawer Slides for Drawers 24 inch Wide or Less: Accuride 7432.
- F. Drawer Slides for Drawers over 24 inch Wide: Accuride 3640.
- G. Drawer slides for File Drawers: Accuride 4034.
- H. Hinges: Rockford Process Control, No. 374, or Terry Hinge H08-99L60, heavy duty wrap-around, extended panel, tight pin butts of steel, 2-3/4 inch minimum width with companion magnetic door catch capable of a minimum 10 pound pull capacity. Hinges per leaf: 3'-0" high doors - 2 hinges, 3'-0" to 5'-0" high doors - 3 hinges, 5'-0" to 7'-4" high doors - 4 hinges, 7'-0" to 8'-0" - 5 hinges.
- I. Magnetic Door Catch: Epcos 591/592.
- J. Sliding Door Track Assemblies: Grant 2023N sheaves and Grant 2011 track.
- K. Grommets: Doug Mockett and Company, Inc., www.mockett.com. SG Series; plastic 1-3/4 inch diameter, as required. Colors as selected by Architect.
- L. Hanger Rods: 1-1/16 inch diameter tubing, stainless steel.
- M. Seismic Shelf Lip: 1/4 inch thick x 3 inch high acrylic plastic or PVC edging of color selected by Architect. Ease all edges of plastic.
- N. Countertop Support Bracket: 24 inch x 24 inch x 1/8 inch thick pre-manufactured angled steel bracket, black paint finish, minimum 1,000 lb. load support capability, with 7 predrilled anchor holes per bracket leg. Manufactured by A & M Hardware, Inc. www.aandmhardware.com
- O. Remainder of hardware required shall meet requirements of ANSI/BHMA Grade 1.
- P. Plumbing and electrical service fixtures as indicated in Division 22 and Division 26.
- Q. Substitutions: Under the provisions of Section 01 25 13.

2.7 FABRICATION

- A. Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.
- B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
- C. Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes, and other fixtures and fittings. Verify locations of cutouts from on-site dimensions. Seal contact surfaces of cut edges.
- D. Before installation, seal unfinished material installed for backs, bases, self-edge backing, stripping and other concealed portions with a water-repellant sealer.
- E. Install plastic grommets in the field in plastic laminate casework and Owner furnished furniture as directed by the Owner's Representative and/or Architect.
- F. Install one adjustable shelf for each 1'-0" of height for all wall mounted cabinets.
- G. Provide stretcher at top face of all door and drawer fronts.
- H. Provide locks on all doors and drawers.
- I. Verify keying requirements with Owner. All cabinet and drawer locks to be keyed alike within individual rooms. Provide 4 keys for each room and 4 master keys. Coordinate keying with Section 08 71 00.
- J. Provide vertical markerboard surfacing on cabinet doors as indicated on drawings.

2.8 RESTORATION AND SURFACE PREPARATION OF EXISTING CABINETS

- A. Only skilled workers who are experienced in cabinetry repairs and restoration, have the skills required for the work of this section, and are familiar with the materials and methods required for laminate-clad wood cabinet restoration work shall be used.
- B. In the acceptance or rejection of the restoration work, no allowance will be made for lack of skill on the part of the workers or their lack of experience.
- C. Coordinate restoration of existing surfaces so that they are exposed for a minimal amount of time prior to refinishing to avoid further damage to bare wood.
- D. Protect all adjacent surfaces from damage or deterioration resulting from restoration work.
- E. Protect restoration work in progress to prevent further deterioration of exposed surfaces.
- F. Remove and relocate existing cabinetry to new locations as indicated. Provide additional scribe strips as needed for adjacent cabinetry or abutting walls.
- G. Adjust height of toe space as required to conform to designated height of countertop.
- H. Remove all decayed laminate-clad cabinetry to a clean, sound unaffected substrate.
- I. Remove plastic laminate cladding on face frames and end panels of cabinetry.
- J. All peeling and loose plastic laminate shall be removed.
- K. Wash all surfaces with recommended neutralizing agents to remove any foreign particles and chemical residue.
- L. Remove existing hardware and fill all holes with repair compound. Sand surface even and smooth.
- M. Relaminate face frames and end panels with plastic laminate.
- N. Install new hardware. Installation to include hinges, pulls, locks, and drawer slides. Adjust for proper operation.

3. PART 3 EXECUTION

3.1 INSPECTION

- A. Verify adequacy of backing and support framing.

3.2 INSTALLATION

- A. Set and secure casework in place rigid, plumb, and level.
- B. Install casework in accordance with Section 10 of the North American Architectural Woodwork Standards.
- C. Install casework items in accordance with the Woodwork Institute's Certified Seismic Installation Program (CSIP)
- D. Install countertops in accordance with Section 11 of the North American Architectural Woodwork Standards.

3.3 ADJUSTING AND CLEANING

- A. Adjust doors, drawers, hardware, fixtures and other moving or operating parts to function smoothly and correctly.
- B. Clean casework, counters, shelves, hardware, fittings and fixtures.

END OF SECTION

SECTION 06 65 00

EXTERIOR SYNTHETIC TRIM

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Exterior synthetic (poly-ash) trim.

1.2 RELATED REQUIREMENTS

- A. Section 09 91 00 – Painting: Painting exterior synthetic trim.

1.3 REFERENCE STANDARDS

- A. ASTM C 1185 – Standard Test Methods for Sampling and Testing Non-Asbestos Fiber-Cement Flat Sheet, Roofing and Siding Shingles, and Clapboards.
- B. ASTM D 570 – Standard Test Method for Water Absorption of Plastics.
- C. ASTM D 1761 – Standard Test Methods for Mechanical Fasteners in Wood.
- D. ASTM D 6341 – Standard Test Method for Determination of the Linear Coefficient of Thermal Expansion of Plastic Lumber and Plastic Lumber Shapes Between -30 and 140°F (-34.4 and 60°C).
- E. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- F. AWPA E1 – Standard Method for Laboratory Evaluation to Determine Resistance to Subterranean Termites.
- G. AWPA E10 – Standard Method of Testing Wood Preservatives by Laboratory Soil-Block Cultures.

1.4 SUBMITTALS

- A. Comply with Section 01 33 00 – Submittal Procedures.
- B. Product Data: Submit manufacturer's product data, including installation instructions.
- C. Samples: Submit manufacturer's sample of exterior synthetic trim, minimum 1 inch by 4 inches by 8 inches long.
- D. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.
- E. Warranty Documentation: Submit manufacturer's standard warranty.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Storage and Handling Requirements:
 - 1. Store and handle materials in accordance with manufacturer's instructions.
 - 2. Keep materials in protective covering until installation.
 - 3. Store materials in clean, dry area.
 - 4. Store exterior synthetic trim on flat, level surface.
 - 5. Keep exterior synthetic trim covered and free of dirt and debris.
 - 6. Protect materials and finish during storage, handling, and installation to prevent damage.

1.6 WARRANTY

- A. Warranty Period for Exterior Synthetic Trim: 20-year limited warranty.
 - 1. No decay due to rot.
 - 2. No excess swelling from moisture.
 - 3. Resist termite damage.

2. PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Boral Composites Inc., 200 Mansell Court East, Suite 305, Roswell, Georgia 30076. Toll Free 888-926-7259. www.BoralTruExterior.com. info@TruExterior.com.
- B. Substitutions: Under provisions of Section 01 25 13.
- C. No request for approval of equal substitutions will be considered after bid award

2.2 EXTERIOR SYNTHETIC TRIM

- A. Exterior Synthetic (Poly-ash) Trim: Boral TruExterior[®] Trim.
- B. Composition:
 - 1. Post-Industrial Recycled Content: Minimum 70 percent, by weight.
 - 2. Post-Consumer Recycled Content: Minimum 2 percent, by weight
 - 3. Pigments and dyes.
- C. Physical Properties:
 - 1. Density, ASTM C 1185: 40 to 50 pcf.
 - 2. Water Absorption, ASTM D 570: Less than 1.5 percent.
 - 3. Fungi Rot, AWPA E10:
 - (a) White Rot: Negligible loss.
 - (b) Brown Rot: Negligible loss.
 - 4. Termite Resistance, AWPA E1: Greater than 9.0, with 10 being impervious.
- D. Mechanical Properties:
 - 1. Flexural Strength, ASTM C 1185: Greater than 1,600 psi.
 - 2. Nail Withdrawal, ASTM D 1761: Greater than 40 lbf/in.
- E. Thermal Properties:
 - 1. Coefficient of Linear Expansion, ASTM D 6341, Typical: 1.40E-05 in/in/degree F, tested at minus 30 to 140 degrees F.
 - 2. Flame Spread, ASTM E 84: Between 25 and 29
 - 3. Smoke Developed, ASTM E 84: Less than 450.

F. Trim Sizes:

Nominal Size	Actual Size
1 by 4	3/4" by 3-1/2"
1 by 6	3/4" by 5-1/2"
1 by 8	3/4" by 7-1/4"
1 by 10	3/4" by 9-1/4"
1 by 12	3/4" by 11-1/4"
5/4 by 4	1" by 3-1/2"
5/4 by 6	1" by 5-1/2"
5/4 by 8	1" by 7-1/4"
5/4 by 10	1" by 9-1/4"
5/4 by 12	1" by 11-1/4"
5/8 by 6 Beadboard	5/8" by 5 1/4"

G. Manufacturing Tolerances:

1. Width: Plus or minus 1/16 inch.
2. Thickness: Plus or minus 1/16 inch.
3. Length: Plus 2 inches, minus 0 inch.
4. Edge Cut: Plus or minus 2 degrees.

H. Exposed Texture: Woodgrain.

2.3 FINISHES

A. Primer:

1. Acrylic based.
2. Low VOC.
3. Factory applied on all sides.

2.4 FASTENERS

A. Type: Screws As indicated on the Drawings.

1. Size: As indicated on the Drawing.
2. Finish: Galvanized.

3. PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to receive exterior synthetic trim.
- B. Notify Architect of conditions that would adversely affect installation or subsequent use.
- C. Do not begin installation until unacceptable conditions are corrected.

3.2 INSTALLATION

- A. Install exterior synthetic trim in accordance with manufacturer's instructions at locations indicated on the Drawings.
- B. Do not install exterior synthetic trim in structural or load-bearing applications.

- C. Install exterior synthetic trim plumb, level, and square.
- D. Install exterior synthetic trim with flush, tight joints.
- E. Install Fasteners:
 - 1. Maximum of 24 inches on center.
 - 2. Within 2 inches of end of boards.
- F. Fill nail and screw holes with acrylic caulk, wood filler, or auto body filler.
- G. Repair minor damages to exterior synthetic trim in accordance with manufacturer's instructions and as approved by Architect.
- H. Remove and replace damaged exterior synthetic trim that cannot be successfully repaired as determined by Architect.
- I. Painting:
 - 1. Apply top coat to exterior synthetic trim over factory-applied primer.
 - (a) Within 150 days of installing trim.
 - (b) As specified in Section 09 90 00.

3.3 PROTECTION

- A. Protect installed exterior synthetic trim to ensure that, except for normal weathering, trim will be without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 07 21 16

BLANKET INSULATION

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Batt insulation and vapor barrier in exterior wall and roof construction.
- B. Batt insulation for filling door shim spaces, crevices in exterior wall, and roof.
- C. Batt sound insulation in interior walls and partitions and above ceiling.

1.2 REFERENCES

- A. ASTM C665 - Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
- B. ASTM C1320 - Installation of Mineral Fiber Batt and Thermal Insulation for Light Frame Construction.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- D. CBC - California Building Code, (CCR) California Code of Regulations, Title 24, Part 6.
- E. Business and Professions Code.

1.3 PERFORMANCE REQUIREMENTS

- A. Materials of this Section shall provide continuity of thermal and moisture barrier at building enclosure elements.
- B. Materials of this Section shall provide continuity of sound control where indicated or scheduled.

1.4 REGULATORY REQUIREMENTS

- A. Installation of insulation may only commence if insulation meets mandatory manufacturer certification to the California Energy Commission required by Title 24, Part 6, Section 110.8 of the CBC - California Building Code, (CCR) California Code of Regulations that insulation complies with Title 24, Part 12, Chapter 12-13, Article 3 of the California Quality Standards for Insulating Materials.
- B. Insulation products shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- C. Insulation materials to be certified in compliance with Business and Professions Code Section 19165.
- D. Insulation manufacturer to be licensed by the California Department of Consumer Affairs, Bureau of Home Furnishing and Thermal Insulation according to Business and Professions Code, Section 19059.7.

1.5 SUBMITTALS

- A. Submit manufacturer's certificates under provisions of Section 01 33 00 that materials meet or exceed specified regulatory requirements.

2. PART 2 PRODUCTS

2.1 MANUFACTURERS - INSULATION MATERIALS

- A. Certain Teed Corp., www.certainteed.com.
- B. Johns Manville Corp., www.jm.com.

- C. Knauf Insulation, www.knaufinsulation.us.
- D. Owens-Corning Fiberglass Corporation, www.owenscorning.com.
- E. Substitutions: Under provisions of Section 01 25 13.

2.2 MATERIALS

- A. Thermal Batt Insulation, Concealed Wall and Roof: ASTM C665 Preformed fiber glass batt, Type II Kraft Faced, Class C, Category 1 "SmartBatt", with stapling flange for attachment to applicable construction. Equivalent continuous roll membrane facing of "MemBrain" Continuous Air Barrier and Smart Vapor Retarder may be utilized in lieu of individual glass fiber batts. Provide R30 at roofs, R19 at walls.
- B. Acoustical Batt Sound Insulation, Concealed Wall and Ceiling: ASTM C665 preformed glass fiber batt, Type I unfaced, with flame spread of 25 or less, and a smoke density of 450 or less when tested in accordance with ASTM E84. Provide 6-1/2 inch thickness.
- C. Insulation to be formaldehyde-free.
- D. Nails or Staples: Steel wire; electroplated; type and size to suit application.
- E. Tape: Bright aluminum self-adhering type, mesh reinforced, 2 inch wide.
- F. Support Wire: 16 gauge steel wire.
- G. Support Rods: 13 gauge, pointed spring steel length as required for stud spacing.
- H. Spindle Fasteners: Steel impale spindle and clip on flat metal base, self adhering backing, length to suit insulation thickness, capable of securely and rigidly fastening insulation in place.

3. PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate, adjacent materials, and insulation are dry and ready to receive insulation.
- B. Verify that enclosed spaces are ventilated to dissipate humidity.
- C. Maximum relative humidity level of less than 50 percent shall be maintained during installation of insulation.

3.2 INSTALLATION

- A. Install insulation in accordance with insulation manufacturer's instructions and ASTM C1320.
- B. Install batt insulation in exterior walls and roof spaces without gaps or voids.
- C. Fill any small spaces around door frames, window frames, skylight frames, and other wall or roof openings with insulation.
- D. Fill hollow space of steel door frame, steel window frame and other wall or roof frame with insulation.
- E. Fill hollow space created by wall or roof framed headers and jamb spaces with insulation.
- F. Install batt sound insulation in interior walls full height of wall.
- G. Install batt sound insulation above ceilings in areas as indicated. Extend a minimum of 4'-0" beyond face of vertical dividing partitions of space to be insulated where partition terminates at ceiling.
- H. Install batt sound insulation at underside of floor decking between adjacent floor levels.
- I. Trim insulation neatly to fit spaces.

- J. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within the plane of insulation. Leave no gaps or voids.
- K. Install with factory applied membrane facing warm side of building spaces.
- L. Lap ends and side flanges of vapor barrier membrane over face of framing members.
- M. Extend vapor barrier on to any adjacent construction and tape seal edge of vapor barrier.
- N. Seal butt ends, lapped flanges, and tears or cuts in membrane with tape or another layer of membrane.
- O. Seal joints in vapor barrier caused by pipes, conduits, electrical boxes, and similar items penetrating vapor barrier.
- P. Tape stapling flange over flange of adjacent blanket to flange of metal stud.
- Q. Friction fit sound insulation between studs and fill as required to completely fill space between the wall finishes.
- R. Where wall finish does not occur, use support rods spaced not-to-exceed 16 inches oc vertically at wood studs.
- S. Retain unsupported roof insulation to metal or concrete substrate with spindle fasteners at 24 inches on center.

END OF SECTION

SECTION 07 25 00

WEATHER BARRIERS

1. PART 1 GENERAL

1.1 SECTION INCLUDES

A. Scope:

1. The following is defined as weather barriers:
 - (a) Provide two layers of weather resistive barrier under all exterior finishes at exterior walls.
 - (b) Provide a separation layer of 60 minute Grade D building paper between all cement plaster and/or fiber cement siding material, and the weather resistive barrier.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 07 46 40 - Fiber Cement Siding
- B. Section 09 24 00 - Portland Cement Plaster

1.3 QUALITY ASSURANCE

- A. ES Report; ICC Evaluation Service, Inc. and Standards referenced therein.

1.4 MOCK-UP

- A. Prepare a mock-up, and assemble and install with all typical fasteners.
 1. Provide mock-up with a minimum area of 100 square feet.
 2. Make such modifications as necessary to achieve a satisfactory mock-up, or remove and construct an additional mock-up. Unacceptable work shall be removed.
- B. Deviations from the approved mock-up are not permitted unless approved by the District. The District reserves right to reject any or all deviations from the approved mock-up for any reason or no reason.

1.5 SUBMITTALS

- A. Product Data: Furnish manufacturer's literature including installation guidelines.
- B. Samples:
 1. Submit two samples 12 inches long.
 2. Submit samples of fasteners.

1.6 PRODUCT HANDLING

- A. Comply with manufacturer's recommendations.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install weather resistive barrier on wet or damp surfaces. After precipitation, allow a minimum of 48 hours for drying before installing weather resistive barrier.
- B. Do not apply during inclement weather. Do not apply weather resistive barrier when precipitation is forecast to occur within 48 hours.
- C. Do not apply weather resistive barrier if exterior temperature is above or below temperatures recommended by manufacturer as optimal for applying material.

1.8 SEQUENCING

- A. Contractor shall ensure that all related work is installed in proper sequence as required by work specified in this Section. Of the Specifications

2. PART 2 PRODUCTS

2.1 MATERIALS

- A. For exterior plaster and exterior porcelain tile finish:
 - 1. Weather resistive barrier first layer: Typar Metro Wrap as manufactured by Typar Weather Protection Systems or
 - 2. Weather resistive barrier first layer: Tyvek Commerical Wrap as manufactured by E.I. DuPont de Nemours, www.tyvek.com.
 - 3. Weather resistive barrier second layer: Tyvek StuccoWrap as manufactured by E. I. DuPont de Nemours, www.tyvek.com. Or approved equal manufactured by Typar. Second layer must have grooved surface to allow water drainage. The second layer is the immediate layer next to plaster or porcelain tile finish
- B. For fiber cement siding:
 - 1. Weather resistive barrier: Typar Metro Wrap as manufactured by Typar Weather Protection Systems, provide two layers or
 - 2. Weather resistive barrier: Tyvek Commercial Wrap as manufactured by E.I. DuPont de Nemours, www.tyvek.com. Provide two layers.
- C. Weather resistive barrier first layer is the first layer installed on substrate. Second layer of weather resistive barrier shall be installed on on top of the first layer. The 60 minute Grade D building paper shall be installed over the weather resistive barrier second layer.
- D. Seam Tape: Typar Construction tape or approved equal.

2.2 FASTENERS

- A. Use Type 304 stainless steel fasteners; fasteners shall have 2-inch plastic heads.
 - 1. When steel studs are used, fasteners shall be a stainless steel self tapping screws with a 2-inch plastic washer. Screws shall be of sufficient length to penetrate steel framing in accord with applicable standards and guideline specifications.
 - 2. When wood studs are used, fastener shall be a stainless steel ring shank nail or screw with a 2-inch plastic washer; nail or screw shall be of sufficient length to penetrate wood framing a minimum of 1-1/2-inches.

3. PART 3 EXECUTION

3.1 INSPECTION

- A. Inspect substrates.
- B. Correct unsuitable conditions prior to installing finish work.

3.2 INSTALLATION

A. General:

1. Cover all surfaces of exterior walls wall under cement plaster, and other exterior surfaces as indicated on the Drawings with 2 layers of the specified weather resistive barrier, without holes, tears, or gaps. Secure end laps at supports.
2. Install weather resistive barrier in accordance with referenced standards, recommendations of the manufacturer of weather resistive barrier, and as shown on the Drawings and specified herein.
3. Coordinate installation of weather resistive barrier with sheet metal flashing assemblies and elastomeric flashing tape provided under other Sections of the Specifications to provide and maintain a continuous weatherproof barrier. Sequence this work to weather lap all flashings and the weather resistive barrier to the exterior.
4. Install barrier continuously behind applied accessories.
5. Install shingle style to shed water, with minimum 4 inch overlap horizontally, 6 inch overlap vertically, and 12 inches overlap at corners, at all locations unless otherwise shown on the Drawings.
6. Stagger joints between layers a minimum of 12 inches and end laps a minimum of 18 inches.
7. Lap sheet metal flashing assemblies and seal sheet metal flashing assemblies to weather resistive barrier with elastomeric flashing tape

B. Fastening: Use specified fasteners; fasteners shall be spaced a maximum of 8 inches on center in the horizontal and vertical directions. Offset fasteners approximately four (4) inches between layers.

C. Penetrations: Install elastomeric flashing tape as shown on the Drawings; if a specific penetration is not shown on the Drawings seal with elastomeric flashing tape extending the elastomeric flashing tape over the weather resistive barrier 4 inches in all directions to create a seal against the intrusion of water. Elastomeric flashing tape is specified in another Section of the Specifications.

D. Separation Layer: 60 minute Grade D building paper; weather lap adjacent sheets to shed water and fasten with stainless steel staples at 24 inches on center.

3.3 INSPECTION

A. When a section of exterior wall has been completed, the Contractor shall visually inspect the installation and shall verify the following:

1. All sheet materials have been installed in a shingle fashion overlapped over the row below as shown on the Drawings and/or specified herein.
2. All fasteners are the proper ones, and fastening pattern is as specified herein.
3. All penetrations and terminations have been sealed as shown on the Drawings and/or specified herein.

B. Contractor shall correct all deficiencies in installation of the weather resistive barrier before proceeding with installation of other components that are a part of an exterior wall assembly.

C. Contractor shall repair any cuts or tears with tape recommended by manufacturer of weather resistive barrier.

END OF SECTION

SECTION 07 46 46

FIBER CEMENT SIDING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Factory-finished fiber cement lap siding, panels, soffits, and accessories.

1.2 RELATED SECTIONS

- A. Section 07 25 00 – Weather Barriers
- B. Section 06 10 00 - Rough Carpentry: Sheathing.

1.3 REFERENCES

- A. ASTM D3359 - Standard Test Method for Measuring Adhesion by Tape Test, Tool and Tape.
- B. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees C.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Shop Drawings: Provide detailed drawings of atypical non-standard applications of cementitious siding materials which are outside the scope of the standard details and specifications provided by the manufacturer.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 4 by 6 inches (100 by 150 mm), representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum of 2 years experience with installation of similar products.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store siding on edge or lay flat on a smooth level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.
- C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY

- A. Product Warranty: Limited, non-pro-rated product warranty.
 - 1. HardiePlank lap siding for 50 years.
 - 2. HardieSoffit panels for 50 years.
- B. Finish Warranty: Limited product warranty against manufacturing finish defects.
 - 1. When used for its intended purpose, properly installed and maintained according to Hardie's published installation instructions, James Hardie's ColorPlus finish with ColorPlus Technology, for a period of 15 years from the date of purchase: will not peel; will not crack; and will not chip. Finish warranty includes the coverage for labor and material.
- C. Workmanship Warranty: Application limited warranty for 2 years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: James Hardie Building Products, Inc., which is located at: 26300 La Alameda Suite 400 ; Mission Viejo, CA 92691; Toll Free Tel: 866-274-3464; Tel: 949-367-4980; Fax: 949-367-4981; Email: [request info \(info@jameshardie.com\)](mailto:info@jameshardie.com); Web: www.jameshardiecommercial.com
- B. Substitutions: Under provisions of Section 01 25 13.
- C. No requests for approval of equal substitutions will be considered after bid award.

2.2 SIDING

- A. HardiePlank lap siding, HardieSoffit panels siding requirement for Materials:
 - 1. Fiber-cement Siding - complies with ASTM C 1186 Grade II, Type A.
 - 2. Fiber-cement Siding - classified as noncombustible when tested in accordance with ASTM E 136.
 - 3. Fiber-cement Siding - have a flame-spread index of 0 and a smoke-developed index of 5 when tested in accordance with ASTM E 84.
 - 4. CAL-FIRE, Fire Engineering Division Building Materials Listing - Wildland Urban Interface (WUI) Listed Product. **[[Ask Ben about this one.]]**
 - 5. ICC-ES Evaluation Report No. ESR-2290 (HardiePlank and HardieShingle), ESR-1844 (HardiePanel), and NER-405 (HardieSoffit)
 - 6. City of Los Angeles, Research Report No. 24862.
 - 7. US Department of Housing and Urban Development Materials Release 1263e.
 - 8. California DSA PA-019.
- B. Lap Siding: HardiePlank Lap as manufactured by James Hardie Building Products, Inc.
- C. Type: Select Cedarmill 7-1/4 inches (184 mm) with 6 inches (152 mm)
- D. Soffit Panels: HardieSoffit soffit panel, factory sealed on 5 sides as manufactured by James Hardie Building Products, Inc.
 - 1. Type: Textured Cedarmill vented, provides 5 square inches (32.3 sq.cm) of net free ventilation per linear foot, 12 inches (305 mm) by 12 feet (3658 mm).
 - 2. Thickness: 1/4 inch (6 mm).
- E. Trim: Refer to Section 06 65 00 for trims.

2.3 FASTENERS

A. Wood Framing Fasteners:

1. Wood Framing: 4d common corrosion resistant nails.
2. Wood Framing: 6d common corrosion resistant nails.
3. Wood Framing: 8d box ring common corrosion resistant nails.
4. Wood Framing: 0.089 inch (2.2 mm) shank by 0.221 inch (5.6 mm) head by 2 inches (51 mm) corrosion resistant siding nails.
5. Wood Framing: 0.093 inch (2.4 mm) shank by 0.222 inch (5.6 mm) head by 2 inches (51 mm) corrosion resistant siding nails.
6. Wood Framing: 0.091 inch (2.3 mm) shank by 0.221 inch (5.6 mm) head by 1-1/2 inches (38 mm) corrosion resistant siding nails.
7. Wood Framing: 0.091 inch (2.3 mm) shank by 0.225 inch (5.7 mm) head by 1-1/2 inches (38 mm) corrosion resistant ring shank nails.
8. Wood Framing into WSP: 0.121 inch (3 mm) shank by 0.371 inch (9.4 mm) head by 1-1/4 inches (32 mm) corrosion resistant roofing nails.

2.4 FINISHES

A. Factory Finish: Refer to Exterior Finish Schedule.

1. Product: ColorPlus Technology by James Hardie.
2. Definition: Factory applied finish; defined as a finish applied in the same facility and company that manufactures the siding substrate.
3. Process:
 - a. Factory applied finish by fiber cement manufacturer in a controlled environment within the fiber cement manufacturer's own facility utilizing a multi-coat, heat cured finish within one manufacturing process.
 - b. Each finish color must have documented color match to delta E of 0.5 or better between product lines, manufacturing lots or production runs as measured by photo spectrometer and verified by third party.
4. Protection: Factory applied finish protection such as plastic laminate that is removed once siding is installed
5. Accessories: Complete finishing system includes pre-packaged touch-up kit provided by fiber cement manufacturer. Provide quantities as recommended by manufacturer.

B. Factory Finish Color for Trim, Soffit and Siding Colors:

1. Colors as scheduled.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If framing preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

- C. Nominal 2 inch by 4 inch (51 mm by 102 mm) wood framing selected for minimal shrinkage and complying with local building codes, including the use of water-resistive barriers or vapor barriers where required. Minimum 1-1/2 inches (38 mm) face and straight, true, of uniform dimensions and properly aligned.
 - 1. Install water-resistive barriers and claddings to dry surfaces.
 - 2. Repair any punctures or tears in the water-resistive barrier prior to the installation of the siding.
 - 3. Protect siding from other trades.
- D. Minimum 20 gauge 3-5/8 inch (92 mm) C-Stud 16 inches maximum on center or 16 gauge 3-5/8 inches (92 mm) C-Stud 24 inches (610 mm) maximum on center metal framing complying with local building codes, including the use of water-resistive barriers and/or vapor barriers where required. Minimum 1-1/2 inches (38 mm) face and straight, true, of uniform dimensions and properly aligned.
 - 1. Install water-resistive barriers and claddings to dry surfaces.
 - 2. Repair any punctures or tears in the water-resistive barrier prior to the installation of the siding.
 - 3. Protect siding from other trades.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Install a water-resistive barrier is required in accordance with local building code requirements.
- D. The water-resistive barrier must be appropriately installed with penetration and junction flashing in accordance with local building code requirements.

3.3 INSTALLATION - HARDIEPLANK LAP SIDING

- A. Install materials in strict accordance with manufacturer's installation instructions.
- B. Starting: Install a minimum 1/4 inch (6 mm) thick lath starter strip at the bottom course of the wall. Apply planks horizontally with minimum 1-1/4 inches (32 mm) wide laps at the top. The bottom edge of the first plank overlaps the starter strip.
- C. Allow minimum vertical clearance between the edge of siding and any other material in strict accordance with the manufacturer's installation instructions.
- D. Align vertical joints of the planks over framing members.
- E. Maintain clearance between siding and adjacent finished grade.
- F. Locate splices at least one stud cavity away from window and door openings.
- G. Use off-stud metal joiner in strict accordance with manufacturer's installation instructions.
- H. Wind Resistance: Where a specified level of wind resistance is required Artisan lap siding is installed to framing members and secured with fasteners described in ICC-ES Evaluation Report No. ESR-2290
- I. Face nail to sheathing.
- J. Locate splices at least 12 inches (305 mm) away from window and door openings.

3.4 FINISHING

- A. Finish unprimed siding with a minimum one coat high quality, alkali resistant primer and one coat of either, 100 percent acrylic or latex or oil based, exterior grade topcoats or two coats high quality alkali resistant 100 percent acrylic or latex, exterior grade topcoat within 90 days of installation. Follow paint manufacturer's written product recommendation and written application instructions.

- B. Finish factory primed siding with a minimum of one coat of high quality 100 percent acrylic or latex or oil based exterior grade paint within 180 days of installation. Follow paint manufacturer's written product recommendation and written application instructions.

3.5 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 07 52 00

MODIFIED BITUMINOUS MEMBRANE ROOFING

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cleaning deck surface.
- B. Membrane roofing and base flashings.
- C. Spray applied elastomeric acrylic coating.
- D. Expansion joint covers.

1.2 REFERENCES

- A. ASTM B370 - Standard Specification for Copper Sheet and Strip for Building Construction.
- B. ASTM B749 - Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products.
- C. ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.
- D. ASTM C728 - Perlite Thermal Insulation Board.
- E. ASTM D312 - Asphalt Used in Roofing.
- F. ASTM D412 - Rubber Properties in Tension.
- G. ASTM D2523 - Testing Load-Strain Properties of Roofing Membranes.
- H. ASTM D4601 - Asphalt-Coated Glass Fiber Base Sheet Used in Roofing.
- I. ASTM D6083 – Standard Specification for Liquid Applied Acrylic Coating Used in Roofing.
- J. ASTM D6162 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.
- K. ASTM D6163 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.
- L. ASTM D6164 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcement.
- M. ASTM D6221 - Standard Specification for Reinforced Bituminous Flashing Sheets on Roofing and Waterproofing.
- N. ASTM E408 – Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection – Meter Techniques.
- O. ASTM E903 – Standard Test Method for Solar Absorption, Reflectance, and Transmittance of Materials Using Inspection - Meter Techniques.
- P. CBC – California Building Code, (CRC) California Code of Regulations, Title 24, Part 6.
- Q. CRRC – Cool Roof Rating Council – Product Rating Program CRRC-1.
- R. FM (FM Global) - Roof Assembly Classifications.
- S. NRCA - National Roofing Contractors Association.
- T. UL (Underwriters Laboratories) - Fire Hazard Classifications.

1.3 SYSTEM DESCRIPTION

- A. Modified Bitumen Conventional Roofing System: Three layer SBS membrane system having a spray applied acrylic surfacing.

1.4 SUBMITTALS

- A. Submit manufacturer's product data, summary of weights of materials and installation instructions under provisions of Section 01 33 00.
- B. Submit documentation of conformance of roofing system with regulatory requirements specified under provisions of Section 01 33 00.

1.5 QUALITY ASSURANCE

- A. Perform Work according to roofing system manufacturer's written instructions and applicable recommendations of the NRCA Roofing and Waterproofing Manual and the NRCA Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing.
- B. Maintain a copy of the manufacturer's written instructions and the applicable recommendations of the referenced NRCA publications on site.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the products specified in this Section with five years documented experience.
- B. Applicator: Company specializing in performing the Work of this Section with five years documented experience and approved by system manufacturer.
- C. Work of this Section to conform to manufacturer's instructions.

1.7 REGULATORY REQUIREMENTS

- A. Conform to applicable UL and FM requirements for roof assembly requirements.
- B. Fire Hazard Classification: UL Class B.
- C. Conform to CBC – California Building Code, (CCR) California Code of Regulations, Title 24, Part 6 requirements for a Cool Roof under the Product Rating Program CRRC-1 of the Cool Roof Rating Council.
- D. Windstorm Rating: FM I-90.

1.8 PRE-INSTALLATION CONFERENCE

- A. Convene two weeks prior to commencing Work of this Section, under provisions of Section 01 31 00.
- B. Review installation procedures and coordination required with related Work.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01 61 00.
- B. Deliver products in manufacturer's original containers, dry, undamaged, seals and labels intact.
- C. Store products in weather protected environment, clear of ground and moisture.
- D. Store products in a manner to avoid significant or permanent deflection of roof deck.
- E. Stand roll materials on end.

1.10 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply roofing membrane during inclement weather.
- B. Do not apply roofing membrane to damp or frozen deck surface.
- C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

1.11 COORDINATION

- A. Coordinate work under provisions of Section 01 31 00.
- B. Coordinate the work with installation of associated metal flashings as the work of this Section proceeds.
- C. Notify roofing manufacturer 72 hours prior to commencing work to arrange for inspection of roof application.

1.12 WARRANTY

- A. Provide 20 year manufacturer's warranty under provisions of Section 01 77 00.
- B. Manufacturer's Warranty: No Dollar Limit Warranty covering roof membrane, base flashings, and workmanship equivalent to Signature Series Guarantee offered by the Johns Manville Corporation. Warranty to include repair of roof membrane damage due to windstorms less than or equal to 64 mph.
- C. Provide 2 year roofing installers warranty under provisions of Section 01 77 00.
- D. Roofing Installers Warranty: Warranty shall cover the Work of this section, including installation of all components of roofing system to include roofing membrane, base flashings, fasteners, coatings, sealants, and all penetrations of roofing membrane.

1.13 INSPECTION SERVICE

- A. Manufacturer of the roofing materials shall provide the following services:
 - 1. Application start-up inspection.
 - 2. Periodic inspections during application.
 - 3. Certification of materials used and application.

2. PART 2 PRODUCTS

2.1 MANUFACTURERS - MEMBRANE MATERIALS

- A. Johns Manville Corp., System 3C NCR, www.jm.com.
- B. Other acceptable manufacturers offering equivalent products:
 - 1. GAF, www.gaf.com.
 - 2. M B Technology, www.mbtechnology.com.
 - 3. Certain Teed, www.certainteed.com.
- C. Substitutions: Under provisions of Section 01 25 13.

2.2 MANUFACTURERS – ACRYLIC COATING

- A. National Coatings Corporation, Acryshield A503 Primer with Acryshield A420 Top Coat, CRRC Product ID No. 0626-0004, UL No. R11754 , www.nationalcoatings.com.
- B. Other acceptable manufacturers offering equivalent products:
 - 1. CertainTeed Corporation, Flintcoat-W, CCRC Product No. 0668-0016a, UL No. R11656, www.certainteed.com.
 - 2. Everest Coatings, Inc., EverCoat 710 Primer with EverCoat 500/510 Top Coat, CRRC Product ID No. 0624-0009, UL No. R13336 , www.everestsystemsco.com.
 - 3. GAF, manufacturer's recommended primer with Matrix 322 Top Coat, CRRC No. 0676-0010, UL No. R1306, www.gaf.com.
 - 4. General Coatings, Ultraflex 1500 Base Coat with Ultraflex 1600 Top Coat, CRRC ID No. 0684-0006, UL No. 14330, www.generalcoatings.net.
 - 5. Henry Company, 291 Base Coat with HE 280 Top Coat, CRRC ID No. 0620-0004, UL No. R10185, www.henry.com.
 - 6. Johns Manville, manufacturers recommended primer with TopGard 4000 Top Coat, CRRC ID No. 0662-0002, UL No. R10167, www.jm.com.
 - 7. Republic Powdered Metals, Inc., Solarguard Ultra Prime WB with Solarguard Ultra Top Coat, CRRC ID. No. 0650-0003. UL No. R8480, www.rpminc.com.
- C. Substitutions: Under provisions of Section 01 25 13.

2.3 MEMBRANE MATERIALS

- A. Acrylic Coated Granulated Membrane Cap Sheet: ASTM D6164 Type II, Grade G, asphalt and polyester reinforced membrane with ceramic granules and an integral reflective white surface finish, equivalent to Dynalastic 250 FRCR as manufactured by Johns Manville Corp., with the following characteristics :
 - Thickness : 160 mils
 - Average Weight : 116 lb/100 sq ft
 - Sheet Width : 39 inches
 - Granular Surface : White granular surface with reflective coating.
 - Solar Reflectance : 0.76 when tested by the CRRC
 - Emissivity : 0.85 when tested by the CRRC
- B. Intermediate Sheet: ASTM D6163, Type II, Grade S, SBS modified bitumen coated glass fiber reinforced membrane, DynaBase as manufactured by the Johns Manville Corporation.
- C. Glass Fiber Base Sheet: ASTM D4601, Type II, GlasBase Plus as manufactured by the Johns Manville Corporation.

2.4 BITUMINOUS MATERIALS

- A. Asphalt Bitumen: ASTM D312, Type III.
- B. Flashing Compound: Elastomeric adhesive specially formulated to be compatible to SBS modified bitumen roll goods; asbestos free.

2.5 ROOF SURFACING

- A. Acrylic Roof Top Coat: 100 percent acrylic elastomeric roof coating, white in color, conforming to the following:

Properties	Test	Results
Solids	ASTM D6083	60 percent
Elongation	ASTM D6083	250 percent
Tensile Strength	ASTM D6083	250 SI
Flexibility	ASTM D6083	180 degree bend at – 30 degree F
Solar Reflectance (albedo x 100)	ATSM E903	0.75 percent
Emisivity	ASTM E408	0.90 percent

2.6 BASE FLASHINGS

- A. Base Flashing: Flexible sheet flashing, ASTM D6221, Type 1, modified bitumen, granule surfaced, equivalent to Dynaflex, as manufactured by the Johns Manville Corporation.

2.7 CANT STRIPS

- A. ASTM C728, fire resistant expanded Perlite, preformed to 45 degree angle, 4 inch minimum face dimension.

2.8 TAPERED EDGE STRIPS

- A. ASTM C728 fire resistant expanded perlite, configuration as detailed.

2.9 ACCESSORIES

- A. Roofing Nails: Galvanized or non-ferrous type, size as required to suit application.
- B. Expansion Joint Covers: Expand-O-Flash roof expansion joint covers as manufactured by the Johns Manville Corporation, size and type as detailed.
- C. Lead Sheet: ASTM B749, Type L51121, copper-bearing lead sheet, 2-1/2 to 4 lbs./sq. ft.
- D. Copper Sheet: ASTM B370, Temper H00 of H01, cold-rolled copper sheet, 16 oz./sq. ft.
- E. Slip Sheet: 0.05 lb/sq. ft. rosin sized building paper.
- F. Acrylic Coating Accessories: Acrylic prime coat, 3.0 oz./sq. yd. polyester reinforcing fabric, adhesives, elastomeric caulking compounds and similar materials shall be as approved by the coating manufacturer. Sealants and adhesives shall meet South Coast Air Quality Management District (SCAQMD) Rule 1168.

2.10 SUMMARY OF MATERIALS PER 100 SQUARE FEET

- | | |
|--|----------|
| A. Base sheet (1 ply) | 28 lbs. |
| B. Intermediate sheet (1 ply) | 56 lbs. |
| C. Asphalt moppings (2 @ 23 lbs.) | 46 lbs. |
| D. Cap sheet (1 ply) | 116 lbs. |
| E. Acrylic Prime Coat (1-1/2 gal/coat) | 18 lbs. |
| F. Acrylic Top Coat (2 @ 1-1/2 gal/coat) | 36 lbs. |

3. PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify that deck is supported and secured.
- C. Verify deck is clean and smooth, free of depressions, waves, or projections, properly sloped to drains, valleys, or eaves.
- D. Verify that deck surfaces are dry and free of snow or ice.
- E. Confirm dry deck by moisture meter with 15 to 19 percent moisture maximum.
- F. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, and reglets are in place.
- G. Beginning of installation means installer accepts existing surfaces.

3.2 PROTECTION

- A. Protect building surfaces against damage from roofing work.

3.3 PREPARATION

- A. Verify flatness and tight joints of wood decking. Fill knot holes with latex filler.
- B. Loose lay slip sheet.
- C. Prime metal flashings with acrylic primer.
- D. Install tapered edge strips, 1-1/2 inch thick x 24 inch wide, at all roof penetrations and at all intersections of roof with vertical surfaces.
- E. Nail cants 2 feet o.c. to roof deck. Fit flush at ends and to vertical surfaces. Apply cant 2 inches back from flange and bevel 8 inches from ends at scuppers.

3.4 ASPHALT

- A. Mop Application: Apply asphalt at a temperature range of between 400 degrees to 450 degrees F or per manufacturer's printed EVT range.
- B. Mechanical Spreader: Apply asphalt at a temperature range of between 425 degrees to 475 degrees F or per manufacturer's printed EVT range.
- C. Asphalt shall not be heated above maximum temperature. Asphalt which has been overheated shall be rejected.
- D. Kettle shall be equipped with an accurate thermostat and thermometer.

3.5 BASE SHEET APPLICATION

- A. Lay a strip of base sheet, 8 inches wide, over metal straps and mechanical anchors exposed on deck surface. Fasten in place.
- B. Lay base sheet; lap side edges 3 inches, end laps 4 inches. Nail laps 9 inches o.c. Nail the field area with two rows of nails at 11 inches o.c. staggered, on 18 inch centers.

3.6 MEMBRANE APPLICATION

- A. Temperature of Bitumen at Point of Application: Within 25 degrees F of bitumen rating labeled on bitumen container.
- B. Lap intermediate sheet edges 3 inches, cap sheet edges 4 inches.
- C. Apply membrane in bitumen; seal seams and ends permanently waterproof.
- D. Apply membrane smooth, free from air pockets, wrinkles, or tears.
- E. Reinforce valleys with an additional ply of base sheet 36 inches wide, center over valley. Apply in direction of slope of valley, lapping 4 inches on ends. Solid mop to base sheet.
- F. Extend membrane up cant strips.
- G. Install waterproof cut-off to membrane at end of day's operation. Remove cut-off before resuming roofing.
- H. Mop and seal membrane around roof penetrations.

3.7 FLASHINGS AND ACCESSORIES

- A. Coordinate installation of roof drains and related flashings.
- B. Set base sheet at roof drains in flashing compound 9 inches wide around ring and flange. Provide a minimum 30 inch square, lead or copper flashing set in flashing compound over base sheet. Strip in flashing with two plies of intermediate membrane extending 4 inches and 6 inches beyond the outside edge of flashing. Solid mop flashings, and while hot, embed cap sheet, install clamp ring and tighten entire assembly while membrane is hot.
- C. Seal flashings and flanges of items penetrating membrane.
- D. Install prefabricated roofing expansion joint covers to isolate roof areas as indicated on drawings and in accordance with manufacturer's recommendations.
- E. Apply granule surfaced membrane base flashings to seal membrane to vertical elements. Extend a minimum of 8 inches up vertical surfaces and 4 inches out onto field membrane.
- F. Secure to nailing strips at 6 inches o.c.
- G. Repair edge seams of membrane base flashing with emulsion and granules where bitumen extends beyond seam.

3.8 ACRYLIC ROOF COATING

- A. Repair imperfections in roof field or flashing areas with sealant.
- B. Apply prime coat approximately 3'-10" wide at all valleys, waterways, drain areas, junctions of vertical wall surfaces, mechanical equipment and roof penetrations at the rate of 2 gallons per 100 square feet.
- C. Immediately embed a 3'-4" wide polyester reinforcing fabric into the wet prime coat.
- D. Lap joints in fabric a minimum of 3 inches. Extend fabric up vertical wall and curb surfaces a minimum of 6 inches.
- E. Apply a second prime coat immediately onto polyester fabric at the rate of 1 gallon per 100 square feet. Extend prime coat a minimum of 2 inches beyond edge of fabric.
- F. Allow prime coat to dry for 24 hours.
- G. Apply roof prime coat over entire roof surface at the rate of 1-1/2 gallons per 100 square feet.

- H. Extend prime coat up vertical wall surface 3 inches minimum above termination of base flashing.
- I. Allow prime coat to dry for 24 hours.
- J. Apply first application of roof top coating at the rate of 1-1/2 gallons per 100 square feet.
- K. Allow first application of roof top coating to dry for a minimum of 12 hours.
- L. Apply second application of roof top coating in a perpendicular pattern to first application at the rate of 1-1/2 gallons per 100 square feet.
- M. Cut edges of final roof top coating application evenly and uniformly.

3.9 FIELD QUALITY CONTROL

- A. Field inspection will be performed under provisions of Section 01 45 29.
- B. Correct identified defects or irregularities.
- C. Site attendance of roofing materials manufacturers during installation of the Work is required.

3.10 CLEANING

- A. Remove bituminous and acrylic spray markings from finished surfaces.
- B. In areas where finished surfaces are soiled by Work of this Section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.
- C. Repair or replace defaced or disfigured finishes caused by Work of this Section.

3.11 PROTECTION

- A. Protect building surfaces against damage from roofing work.
- B. Upon completing roofing, including associated work, institute appropriate procedures for surveillance and protection of roofing during remainder of construction period.
- C. Where traffic must continue over finished roof membrane, protect surfaces.
- D. At end of construction period, or at a time when remaining construction will in no way affect or endanger roofing, inspect roofing and prepare a written report with copies to Architect describing nature and extent of deterioration or damage found.
- E. Repair or replace, as required, deteriorated or defective work found at time of above inspection to a condition free of damage and deterioration at time of Substantial Completion according to requirements of specified warranty.

END OF SECTION

SECTION 07 62 00

SHEET METAL FLASHING AND TRIM

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Pre-coated coping, parapet, and cap flashings.
- B. Counter flashing at piping penetrations, vent pipes, and conduits.

1.2 REFERENCES

- A. ANSI / SPRI ES-1 Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.
- B. ASTM A653 - Steel Sheet, Zinc-Coated, (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- C. ASTM A755 - Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
- D. ASTM A792 – Steel Sheet, Aluminum-Zinc Alloy. Coated by the Hot-Dip Process, General Requirements.
- E. ASTM A924 - General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
- F. ASTM B32 - Solder Metal.
- G. ASTM B101 - Standard Specifications for Lead-Coated Copper Sheet and Strip for Building Construction.
- H. ASTM D4586 - Asphalt Roof Cement, Asbestos Free.
- I. SMACNA - Architectural Sheet Metal Manual.

1.3 SYSTEM DESCRIPTION

- A. Work of this Section is to physically protect membrane roofing, built-up roofing, and base flashings, from damage that would permit water leakage to building interior.

1.4 QUALITY ASSURANCE

- A. Applicator: Company specializing in sheet metal flashing work with five years minimum experience.
- B. Perform work in accordance with SMACNA standard details and requirements.
- C. Copings and roof edge flashings shall conform to SPRI ES-1 testing and shall be in compliance with SMACNA Technical Resource Bulletin #5-09.
- D. SPRI Wind Design Standard: Manufacture and install copings and roof edge flashings capable of resisting an ultimate design wind speed of 115 miles per hour.

1.5 SUBMITTALS

- A. Submit shop drawings, product data, and samples under provisions of Section 01 33 00.
- B. Submit shop drawings of sheet metal items indicating profiles, jointing, terminations and installation details. Indicate type and spacing of fasteners.
- C. Submittal of specific plates from the SMACNA Architectural Sheet Metal Manual constitutes acceptable documentation of installation details.
- D. Submit product data for pre-coated galvanized steel.

- E. Submit two samples, 4 x 4 inch in size illustrating metal finish color for pre-coated steel.
- F. Submit product data for flashing accessories.
- G. Submit warranty for water tightness.
- H. Submit warranty for metal finish.

1.6 STORAGE AND HANDLING

- A. Store products under provisions of Section 01 61 00.
- B. Stack preformed material to prevent twisting, bending, or abrasion, and to provide ventilation.
- C. Prevent contact with materials during storage which may cause discoloration, staining, or damage.

1.7 WARRANTY

- A. Provide warranty under provisions of Section 01 77 00.
- B. Provide 2-year warranty coverage for degradation of water tightness and integrity of seals.
- C. Provide 20-year warranty coverage for metal finish from all defects.

2. PART 2 PRODUCTS

2.1 SHEET MATERIALS

- A. Pre-Coated Galvanized Steel: ASTM A755 on zinc-coated galvanized substrate, ASTM A653, Grade 33, G90 zinc coating in accordance with ASTM A924 or ASTM A792, Grade 50, AZ55 aluminum zinc coating; 0.0299 inch thick core steel.

2.2 ACCESSORIES

- A. Lead-Coated Copper: ASTM B101, Temper H00 and H01, cold-rolled copper sheet, coated both sides with lead weighing not less than 12 lb/100 sq. ft. or more than 15 lb./100 sq. ft. total weight of copper sheet with lead applied to both sides.
- B. Fastener: Galvanized steel or stainless steel with soft neoprene washers at exposed fasteners. Finish exposed fasteners same as pre-coated metal.
- C. Underlayment: Spunbound reinforced polypropylene coated fabric sheet.
 - 1. Premium Grade Feltex as manufactured by SystemComponents Corp., www.systemcomponents.net.
 - 2. Premium Summit Synthetic Underlayment as manufactured by Atlas Roofing Corp., www.atlasroofing.com.
 - 3. Roof Top Guard II Underlayment as manufactured by Underlayment Specialties Plus, www.uspunderlayment.com.
 - 4. Substitutions: Under provisions of Section 01 25 13.
- D. Slip Sheet: 0.05 lb./sq. ft., rosin sized building paper.
- E. Sealant: Type specified in Section 07 92 00.
- F. Bedding Compound: Rubber-asphalt type.
- G. Plastic Cement: ASTM D4586, Type I.

- H. Metal Flashing System: Two piece pre-coated galvanized steel similar to Springlok Flashing System, manufactured by Fry Reglet, www.fryreglet.com, type as indicated. Include fabricated end closures and mitered corners.
- I. Solder for Lead-Coated Copper: ASTM B32, Grade SN 60 percent tin, 40 percent lead.

2.3 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Fabricate concealed cleats of galvanized steel, ASTM A653, Grade 33, G90 zinc coating, 0.0478 inch thickness, interlockable with sheet.
- C. Fabricate exposed cleats and coverplates of same material as sheet, interlockable with sheet.
- D. Form pieces in longest practical lengths.
- E. Hem exposed edges on underside 1/2 inch. Miter and seam corners.
- F. Form material with flat lock seam.
- G. Solder and seal metal joints. After soldering, remove flux. Wipe and wash solder joints clean.
- H. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- I. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.
- J. Fabricate flashings to allow toe to extend 2 inches over bituminous base flashings. Return and brake edges.
- K. Fabricate vent pipe and roof penetration flashings of lead-coated copper with clamping ring.

2.4 FINISH

- A. Kynar 500 or Hylar 5000 shop pre-coated finish with 0.2 mil baked on primer and 0.8 mil baked on topcoat for a 1.0 mil dry film thickness. Color to be selected by Architect from manufacturer's entire range of standard colors.

3. PART 3 EXECUTION

3.1 INSPECTION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, cant strips and reglets are in place, and nailing strips located.
- B. Verify membrane termination and base flashings are in place, sealed, and secure.
- C. Beginning of installation means acceptance of existing conditions.

3.2 PREPARATION

- A. Field measure site conditions prior to fabricating work.
- B. Install starter and edge strips, and cleats before starting installation.
- C. Install surface mounted reglets true to line and level. Seal top with sealant.
- D. Install underlayment with protective slip sheet over parapets, caps, copings, gravel stops and curbs.

3.3 INSTALLATION

- A. Conform to indicated details on the drawings and the recommendations included in the SMACNA Architectural Sheet Metal Manual.
- B. Provide for thermal expansion of exposed sheet metal work. Space movement joints at 10 feet - 0 inches o.c. maximum with no joints within 2 feet - 0 inches of corners.
- C. Form expansion joints of intermeshing hooked flanges filled with sealant.
- D. Insert flashings into reglets to form tight fit. Secure in place with lead wedges at maximum 12 inches on center. Pack remaining spaces with lead wool. Seal flashings into reglets with sealant.
- E. Secure flashings in place using concealed fasteners. Use exposed fasteners only where indicated.
- F. Lap, lock, seam and seal all joints.
- G. Apply plastic cement compound between metal flashings and felt flashings. Apply bituminous coating between dissimilar metals where occurs.
- H. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- I. Roof-Penetration, Vent Pipe Flashing: Turn lead flashing down inside vent piping. Clamp flashing to other pipes penetrating roof except for vent piping. Seal with elastomeric sealant.
- J. Seal metal joints watertight.

3.4 FIELD QUALITY CONTROL

- A. Conform to SMACNA Architectural Sheet Metal Manual.
- B. Field observation will involve surveillance of Work during installation to ascertain compliance with specified requirements.

END OF SECTION

SECTION 07 71 23

MANUFACTURED DOWNSPOUTS

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Galvanized downspouts.
- B. Precast concrete splash blocks.

1.2 REFERENCES

- A. ASTM A53 - Pipe, Steel, Black and Hot-Dipped Zinc-Coated Welded and Seamless.
- B. ASTM A123 - Zinc (Hot-Dip Galvanized) Coating on Iron and Steel Products.
- C. ASTM A653 - Steel Sheet, Zinc Coated, (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- D. ASTM A755 - Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
- E. ASTM A792 - Steel Sheet, Aluminum-Zinc Alloy. Coated by the Hot-Dip Process, General Requirements.
- F. ASTM A924 - General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
- G. SMACNA - Architectural Sheet Metal Manual.

1.3 QUALITY ASSURANCE

- A. Applicator: Company specializing in sheet metal work with five years minimum experience.
- B. Perform work in accordance with SMACNA standard details and requirements.

1.4 STORAGE AND HANDLING

- A. Store products under provisions of Section 01 61 00.
- B. Stack preformed material to prevent twisting, bending, or abrasion and to provide ventilation.
- C. Prevent contact with materials during storage which may cause discoloration, staining or damage.

1.5 WARRANTY

- A. Provide warranty under provisions of Section 01 77 00.
- B. Provide 20-year warranty coverage for metal finish from all defects.

2. PART 2 PRODUCTS

2.1 MATERIALS

- A. Pre-coated Galvanized Steel: ASTM A755 on zinc-coated galvanized substrate, ASTM A653, Grade 33, G90 zinc coating in accordance with ASTM A924, or ASTM A792, Grade 50, AZ55 aluminum zinc coating, thickness as specified.

2.2 COMPONENTS

- A. Downspouts: ASTM A53, Grade B, Schedule 40 steel pipe, standard weight, Type S, one piece without joints, galvanized according to ASTM A53; 1.8 oz./sq. ft.
- B. Splash Blocks: Precast concrete type, of sizes and profiles indicated; minimum 3000 psi at 28 days, with minimum 5 percent air entrainment.

2.3 ACCESSORIES

- A. Anchorage Devices: Meet SMACNA requirements.
- B. End Caps, Downspout Outlets and Strainers, Rain Diverters, Straps, Support Brackets, Joint Fasteners. Profiled to suit gutters and downspouts.
- C. Sealant: Silicone type as specified in Section 07 92 00.

2.4 FABRICATION

- A. Field measure site conditions prior to fabricating work.
- B. Fabricate with required connection pieces.
- C. Form sections square, true, and accurate in size, in maximum possible lengths and free of distortion or defects detrimental to appearance or performance.
- D. Hem exposed edges of metal.
- E. Seal metal joints.
- F. Fabricate downspout accessories; seal watertight.
- G. Form splash pans to size as detailed with rolled edges.

2.5 FINISHING

- A. Kynar 500 or Hylar 5000 shop pre-coated finish on flat sheet metal stock. Finish with 0.2 mil baked on primer and 0.80 mil baked on topcoat for a 1.0 mil dry film thickness. Color to be selected by Architect from manufacturer's entire range of standard colors.

3. PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are ready to receive work.
- B. Beginning of installation means acceptance of existing conditions.

3.2 INSTALLATION

- A. Install gutters, downspouts, and accessories in accordance with SMACNA requirements.
- B. Join lengths with seams sealed watertight. Flash and seal gutters to downspouts and accessories.
- C. Seal metal joints watertight.
- D. Set splash blocks under downspouts.

END OF SECTION

SECTION 07 92 00

JOINT SEALANTS

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Preparing sealant substrate surfaces.
- B. Sealant and backing.

1.2 SUMMARY OF SEALANT LOCATIONS

- A. Joints in horizontal surfaces.
 - 1. Expansion and isolation joints in cast-in-place concrete slabs.
 - 2. Control and expansion joints in soffits, ceilings and overhead surfaces.
 - 3. Perimeter joints in exterior openings.
 - 4. Joints between ceiling surfaces and frames for doors and windows.
 - 5. Joints in flashing and sheet metal.
 - 6. Perimeter joints of plumbing fixtures.
 - 7. Acoustical isolation joints between head and sill of walls and floor and ceiling surfaces.
 - 8. Joints between countertops and wall surfaces.
 - 9. Joints between thresholds and floors.
 - 10. Joints between dissimilar materials and those listed above.
 - 11. Other joints as indicated.
- B. Joints in vertical surfaces:
 - 1. Expansion and isolation joints in cast-in-place concrete.
 - 2. Perimeter joints in exterior openings.
 - 3. Joints in flashing and sheet metal.
 - 4. Perimeter joints of plumbing fixtures.
 - 5. Acoustical isolation joints of walls.
 - 6. Joints between cabinets and walls.
 - 7. Joints between wall surfaces and door and window frames.
 - 8. Joints between dissimilar materials and those listed above.
 - 9. Other joints as indicated.

1.3 REFERENCES

- A. ASTM C834 - Latex Sealing Compounds.
- B. ASTM C919 - Practices for Use of Sealants in Acoustical Applications.
- C. ASTM C920 - Elastomeric Joint Sealants.
- D. ASTM C1193 - Standard Guide for Use of Joint Sealants.
- E. ASTM D1056 - Flexible Cellular Materials - Sponge or Expanded Rubber.
- F. FS TT-S-001657 - Sealing Compound, Single Component, Butyl Rubber Based, Solvent Release Type.
- G. SWRI - (Sealant, Waterproofing and Restoration Institute) - Sealant and Caulking Guide Specification.

1.4 SUBMITTALS

- A. Submit product data under provisions of Section 01 33 00.
- B. Submit product data indicating sealant chemical characteristics, performance criteria, limitations, and color availability.
- C. Submit samples under provisions of Section 01 33 00.
- D. Submit two samples 4 inches long in size illustrating colors selected.

1.5 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum five years documented experience.
- B. Applicator: Company specializing in applying the Work of this Section with minimum three years documented experience, approved by sealant manufacturer.
- C. Conform to Sealant, Waterproofing, and Restoration Institute (SWRI) requirements for materials and installation.
- D. Perform Work in accordance with ASTM C1193.
- E. Perform acoustical sealant application work to provide maximum STC values in accordance with ASTM C919.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not install solvent curing sealants in enclosed building spaces.
- B. Do not install sealant when temperature is less than 40 degrees F.
- C. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.7 OPERATION AND MAINTENANCE DATA

- A. Submit maintenance data under the provisions of Section 01 77 00.
- B. Submit recommended inspection intervals for sealant joints.
- C. Submit instructions for repairing and replacing failed sealant joints.

1.8 WARRANTY

- A. Provide 5 year warranty under provisions of Section 01 77 00.
- B. Include coverage for installed sealants and accessories which fail to achieve air and water seal and exhibit loss of adhesion or cohesion or do not cure.

2. PART 2 PRODUCTS

2.1 MATERIALS

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.
- B. VOC Content of Interior Sealants: Provide interior sealants and sealant primers that comply with the following limits for VOC content limits when calculated according to South Coast Air Quality Management District (SCAQMD) Rule 1168, and must meet or exceed the requirements for the Bay Area Quality Management District Regulation 8, Rule 5.
 - 1. Sealants: 250 g/L.
 - 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 - 3. Sealant Primers for Porous Substrates: 775 g/L.

2.2 MANUFACTURERS

- A. Manufacturers and their products are listed for each type of sealant. Acceptable manufacturers include the following:
 - 1. Pecora Corp., www.pecora.com.
 - 2. Sika Corp., www.sikausa.com.
 - 3. Tremco, Inc., www.tremcosealants.com.
- B. Substitutions: Under provisions of Section 01 25 13.

2.3 SEALANTS

- A. Type A - Acrylic Latex: One-part, non-sag, mildew resistant acrylic emulsion compound complying with ASTM C834, Type S, Grade NS, formulated to be paintable.
 - 1. Tremco, Inc., Acrylic Latex Caulk.
 - 2. Pecora Corporation, AC-20.
 - 3. Sonneborn, Chemrex, Sonolac.
- B. Type B - Butyl Sealant: One-part, non-sag solvent-release-curing sealant complying with FS TT-S-001657 for Type 1 and formulated with a minimum of 75 percent solids.
 - 1. Tremco, Inc., Tremco Butyl Sealant.
 - 2. Pecora Corporation, BC-158.
 - 3. Sonneborn, Chemrex, Multi-Purpose Sealant.

- C. Type D - Non-Sag Polyurethane Sealant: Single component sealant complying with ASTM C920, Type S, Grade NS, Class 25:
 - 1. Pecora Corp., Dynatrol I-XL.
 - 2. Tremco, Inc., Vulkem 921.
 - 3. Sika Corp., Sikaflex 1a.
- D. Type F - One-Part Mildew-Resistant Silicone Sealant: Complying with ASTM C920, Type S, Grade NS, Class 25.
 - 1. Dow Consumer Solutions, Dowsil 786.
 - 2. General Electric Co., Sanitary 1700.
 - 3. Tremco, Inc., Trensil 200.
 - 4. Pecora Corp., 863 or 898 White.

2.4 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Backing: ASTM D1056; round, closed cell polyethylene foam rod; oversized 30 to 50 percent larger than joint width.
- D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

3. PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that joint openings are ready to receive Work and field measurements are as shown on Drawings and recommended by the manufacturer.
- B. Beginning of installation means installer accepts existing substrate.

3.2 PREPARATION

- A. Clean and prime joints in accordance with manufacturer's instructions. Prime if recommended by manufacturer.
- B. Remove loose materials and foreign matter which might impair adhesion of sealant.
- C. Verify that joint backing and release tapes are compatible with sealant.
- D. Perform preparation in accordance with ASTM C1193.
- E. Protect elements surrounding the Work of this Section from damage or disfiguration.

3.3 INSTALLATION

- A. Install sealant in accordance with manufacturer's instructions.
- B. Measure joint dimensions and size materials to achieve required width/depth ratios.
- C. Install joint backing to achieve a neck dimension no greater than 1/3 the joint width.

- D. Install bond breaker where joint backing is not used.
- E. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- G. Tool joints concave unless otherwise detailed.

3.4 CLEANING AND REPAIRING

- A. Clean work under provisions of Section 01 77 00.
- B. Clean adjacent soiled surfaces.
- C. Repair or replace defaced or disfigured finishes caused by Work of this Section.

3.5 PROTECTION OF FINISHED WORK

- A. Protect sealants until cured.
- B. Sprinkler fine silica sand on sealant of exterior concrete paving joints to reduce tracking of sealant.

3.6 SCHEDULE

<u>Type</u>	<u>Location</u>	<u>Color</u>
A. Type A - Acrylic Latex Cure	All interior joints not otherwise scheduled	To match adjacent surfaces
B. Type B - Butyl	Under thresholds	Black
C. Type D - Non-Sag Polyurethane Sealant	Exterior door, entrance and window frames.	To match adjacent surface.
D. Type F - Mildew-Resistant Silicone	Interior joints in ceramic tile and at plumbing fixtures.	Almond

END OF SECTION

SECTION 08 11 13

HOLLOW METAL DOORS AND FRAMES

1. PART 1 GENERAL

1.1 WORK INCLUDED

- A. Non-rated rolled steel doors and frames.
- B. Louvers.

1.2 REFERENCES

- A. ANSI A250.8 - Recommended Specification for Standard Steel Doors and Frames.
- B. ANSI A250.3 - Test Procedure and Acceptance Criteria for Factory-Applied Finish Painted Steel Surfaces for Steel Doors and Frames.
- C. ANSI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
- D. ASTM A653 - Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- E. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation.
- F. ASTM A924 - General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
- G. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace.
- H. CEC - California Energy Commission.
- I. NFPA 80 - Fire Doors and Windows.
- J. SDI-105 - Recommended Erection Instructions for Steel Frames.
- K. DHI - Door and Hardware Institute.
- L. CBC - California Building Code, (CCR) California Code of Regulations, Title 24, Part 2 and Part 6.
- M. UL 9 - Fire Tests of Window Assemblies.
- N. UL 10C - Fire Tests of Door Assemblies.

1.3 QUALITY ASSURANCE

- A. Conform to requirements of ANSI A250.8.
- B. Installed exterior frame and door assembly to be weather tight.
- C. Manufacturer shall have both fabrication and assembly plant located within the continental United States or Canada. Products that are either fabricated or assembled outside the continental United States or Canada are not acceptable.

1.4 REGULATORY REQUIREMENTS

- A. Conform to CBC, California Building Code, (CCR) California Code of Regulations, Title 24, Part 2 for fire rated frames and doors.
- B. Conform to CBC, California Building Code, (CCR) California Code of Regulations, Title 24, Part 6, for U-value and solar heat gain coefficient.

1.5 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 01 33 00.
- B. Indicate frame configuration, anchor types and spacings, location of cutouts for hardware, reinforcement, and finish.
- C. Indicate door elevations, internal reinforcement, closure method, and cut outs for louvers.
- D. Submit two samples of exterior frame profile at mullion intersection.
- E. Submit Certificate NRCC-ENV-05-E, from the Nonresidential Compliance Manual documenting compliance with the CBC, California Building Code, (CCR) California Code of Regulations, Title 24, Part 6, Section 110, Table 110.6-A and 110.6-B.

1.6 DELIVERY, STORAGE AND PROTECTION

- A. Deliver, store, protect, and handle products under provisions of Section 01 61 00.
- B. Store products on site under cover.
- C. Place products on at least 4 inch wood sills to prevent rust and damage.
- D. Protect doors and frames with resilient packaging.

1.7 SEQUENCING AND SCHEDULING

- A. Sequence Work under the provisions of Section 01 11 00.
- B. Schedule Work under the provisions of Section 01 32 16.
- C. Schedule delivery of all doors and frames so as not to delay progress of other trades.

2. PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Curries Mfg., Inc., www.curries.com.
- B. Republic Builders Products Corporation, www.republicdoor.com.
- C. Steelcraft, www.steelcraft.com.
- D. Substitutions: Under provisions of Section 01 25 13.

2.2 DOORS AND FRAMES

- A. Steel: Commercial quality cold rolled steel conforming to ASTM A653 galvanized to A60 or G60 coating class or Type B, A40 (ZF120) according to ASTM A924 with minimized spangle, mill phosphatized.
- B. Exterior Doors: ANSI A250.8, Level 3, extra heavy-duty, Model 2, continuous welded seam, beveled edges, minimum 0.053 inch thick faces.
- C. Exterior Frames: ANSI A250.8, Level 3, 0.067 inch thick material, core thickness.
- D. Interior Frames: ANSI A250.8, Level 2, 0.053 inch thick material, core thickness

2.3 DOOR CORE

- A. Exterior Core: Polystyrene insulation.

2.4 ACCESSORIES

- A. Louvers: Roll formed steel, prime coated, inverted 'Y' blade, sightproof, with countersink, tamperproof fasteners.
- B. Rubber Silencers: Resilient rubber as supplied by Section 08 71 00.
- C. Mineral-Fiber Insulation: ASTM C665, Type 1, without membrane facing; slag or rock wool fibers; with maximum flame spread and smoke developed indexes of 25 and 50; passing ASTM E136 for combustion characteristics.

2.5 FRAME ANCHORS

- A. Wood Stud Anchor: U-shaped anchor, welded to frame, 1 inch wide, 0.053 inch thick steel, with 2 pre-punched holes in nailing flange. UL listed as required for fire rating.
- B. Existing Wall Anchor: 0.053 inch thick pipe spacer with 2 inch x 0.053 inch thick steel plate sized to accommodate a 3/8 diameter countersunk flathead expansion anchor. UL listed as required for fire rating.
- C. Floor Clip: Angle anchor, full width of frame, 0.067 inch thick steel.

2.6 HARDWARE REINFORCEMENT

- A. Fabricate frames and doors with hardware reinforcement plates welded in place.
- B. Hinge reinforcing shall be full width of frame profile.
- C. Provide spacers for all thru-bolted hardware.
- D. Reinforcement components shall be the following minimum thickness:
 - 1. Hinge (door and frame) 3/16 inch
 - 2. Mortise Lock or Deadbolt 0.093 inch
 - 3. Flush Bolt Front 0.093 inch
 - 4. Surface Applied Closer 0.093 inch

2.7 FABRICATION

- A. When shipping limitations so dictate, frames for large openings shall be fabricated in sections designed for splicing.
- B. All spliced joints shall occur on the interior side of exterior frames.
- C. Fabricate frames as full profile welded units.
- D. All face, rabbet and soffit joints between abutting members shall be continuously welded and finished smooth when exposed to exterior.
- E. Corner joints shall have all contact edges closed tight, with faces mitered and continuously welded.
- F. Frames with multiple openings shall have mullion members fabricated with no visible seams or joints. All face, rabbet and soffit joints between abutted members shall be continuously welded and finished smooth when exposed to exterior.
- G. Provide 3/8 inch back bend return on frames where gypsum board wall material occurs whether on one or both sides.
- H. Dust cover boxes or mortar guards of 0.016 inch thick steel shall be provided at all hardware mortises on frames.

- I. Reinforce frames wider than 48 inches with roll formed, 0.093 inch thick steel channels fitted tightly and welded into frame head, inverted U-shape profile.
- J. Prepare frame for silencers except for frames which receive weatherstripping. Provide three single rubber silencers for single doors on strike side, and two single silencers on frame head at double doors without mullions.
- K. Provide steel spreader temporarily attached to feet of both jambs as a brace during shipping and handling. Spreader is not to be used for installation purposes.
- L. Attach fire rated label to each frame and door unit.
- M. Close top edge of exterior door flush with inverted steel channel closure. Weld all joints watertight.

2.8 MANUFACTURING TOLERANCE

A. Manufacturing tolerance shall be maintained within the following limits:

1. Frame width	+1/16 inch -1/32 inch
2. Frame height	+3/64 inch
3. Frame face	+1/32 inch
4. Frame stop	+1/32 inch
5. Frame rabbet	+1/64 inch
6. Frame depth	+1/32 inch
7. Frame throat	+1/16 inch
8. Door width and height	+3/64 inch
9. Door thickness	+1/16 inch
10. Hardware location	+1/32 inch
11. Door flatness	+1/16 inch

2.9 FINISH

- A. Primer: Baked on rust-inhibitive enamel.
- B. Finish: Site paint under provisions of Section 09 90 00.

3. PART 3 EXECUTION

3.1 INSTALLATION

- A. Install frames in accordance with SDI-105.
- B. Install doors in accordance with DHI.
- C. Installation of exterior doors and frames to be weathertight and waterproof.
- D. Seal penetration of all surface applied screws on exterior face of frames at glass stops and hardware attachments.
- E. Coordinate installation with electrically controlled locks.

- F. Coordinate with wall construction and details for anchor placement. Provide anchors as follows:
 - 1. Floor anchors - 1 anchor each jamb for interior doors. Where wall construction will not allow placement of floor anchor, provide one additional jamb anchor as close to floor as possible. At exterior doors set frames 2 inches into blocked out recess and grout flush with floor.
 - 2. Existing wall anchors shall be welded to provide non-removable condition. Welded bolt head to be ground, dressed and finished smooth.
- G. Frames installed in masonry walls to be fully grouted with masonry grout.
- H. Exposed field welds to be finished smooth and touched up.
- I. Primed or painted surfaces which are scratched or marred shall be touched up.
- J. Hardware to be applied in accordance with hardware manufacturer's templates and instructions.
- K. Coordinate installation of glass and glazing.
- L. Install door louvers.
- M. Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.
- N. Solidly pack mineral-fiber insulation into frames installed in exterior walls that are not solid grouted. For vertical and horizontal frame mullions that are inaccessible after frame assembly place insulation into frame before joining members together.

3.2 INSTALLATION TOLERANCES

- A. Edge clearance for swinging doors shall not exceed the following:

1. Between door and frame at head and jamb	1/8 inch
2. Between edge of pair of doors	1/8 inch
3. At door sill with threshold (From bottom of door to top of threshold)	3/8 inch
4. At door sill with no threshold	1/2 inch
5. At door bottom and rigid floor covering per NFPA 80	1/2 inch
6. At door bottom and nominal floor covering per NFPA 80	5/8 inch
- B. Frame installation tolerance shall not exceed the following:

1. Squareness	+-1/16 inch
2. Alignment	+-1/16 inch
3. Plumbness	+-1/16 inch
4. Diagonal Distortion	+-1/32 inch

END OF SECTION

SECTION 08 14 00

WOOD DOORS

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Flush faced wood doors non-rated.

1.2 REFERENCES

- A. ANSI/WDMA - Wood Door Manufacturers Association I.S. 1-A-04-Architectural Wood Flush Doors.
- B. CBC - California Building Code, (CCR) California Code of Regulations, Title 24, Part 2.
- C. NWWDA I.S.1 - Industry Standard For Wood Flush Doors (Includes Standards I.S.1.1 through I.S.1.7).
- D. FSC - Forest Stewardship Council.
- E. WI - Woodwork Institute North American Architectural Woodwork Standards 3.0.

1.3 QUALITY ASSURANCE

- A. Conform to requirements of The WI North American Architectural Woodwork Standards, Section 9 Custom Grade except where otherwise indicated.
- B. All wood doors and the installation of wood doors shall be monitored for compliance under the scope of the WI Certified Compliance Program (CCP).
- C. Issue a WI Certified Compliance Certificate prior to delivery of doors certifying that doors meet all requirements of WI Grade specified.
- D. After completion issue a WI Certified Compliance Certificate for Installation

1.4 SUBMITTALS

- A. Submit shop drawings under provisions of Section 01 33 00. Shop drawings shall bear the WI Certified Compliance Label on the first page of each set.
- B. Indicate door elevations, stile and rail reinforcement, internal blocking for hardware attachment.
- C. Submit samples under provisions of Section 01 33 00.
- D. Submit two samples 12 x 12 inch in size illustrating each species and finish.

1.5 DELIVERY, STORAGE, AND PROTECTION

- A. Protect products under provisions of Section 01 61 00.
- B. Package, deliver, and store doors in accordance with WI requirements as set forth in Section 2 of The WI North American Architectural Woodwork Standards.

1.6 WARRANTY

- A. Provide manufacturer's standard 1 year warranty for exterior doors under provisions of Section 01 77 00 for solid core doors.

2. PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS, FLUSH FACED DOORS

- A. Algoma Hardwoods, www.algomahardwoods.com.
- B. Door America-American Building Supply, Inc., www.dooramerican.com.
- C. Eggers Industries, www.eggersindustries.com.
- D. Haley Architectural Doors, www.haleybros.com.
- E. Substitutions: Under provisions of Section 01 25 13.

2.2 DOOR CONSTRUCTION

- A. Hollow Core: NWWDA I.S.1; mesh or cellular core including lock blocks, vertical edge bands, and top and bottom rails.
- B. Construction: WI, Custom grade, ANSI/WDMA extra heavy duty, 5 ply, manufactured as an edge bonded, sanded core assembly, laminated in a one-step, hot pressed operation. Cold-press method is not acceptable.
- C. Flush Interior Door Veneer:
 - 1. White Birch species; plain sliced with book matched grain, for transparent clear finish. Satin sheen. Factory finish. Color as selected.

2.3 ADHESIVES

- A. Interior Doors: WI Type I.

2.4 FABRICATION

- A. Fabricate non-rated wood doors to requirements of The WI North American Architectural Woodwork Standards, Section 9, in the WI Grade specified.
- B. Premachine doors for finish hardware.

3. PART 3 EXECUTION

3.1 INSTALLATION

- A. Install doors in accordance with The WI North American Architectural Woodwork Standards Section 9.
- B. Conform to WI and NFPA requirements for fit tolerances.
- C. Coordinate installation of glass and glazing.
- D. Install door louvers.
- E. Adjust doors for smooth and balanced movements.

3.2 INSTALLATION TOLERANCES

- A. Edge clearance for swinging doors shall not exceed the following as required by WI and NFPA 80:
 - 1. Between door and frame at head and jamb 1/8 inch
 - 2. Diagonal distortion 1/8 inch
 - 3. At door sill with no threshold 1/2 inch

END OF SECTION

SECTION 08 33 23

OVERHEAD COILING DOORS

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Non-fire rated overhead coiling counter service doors, crank operation, stainless steel finish with integral frame and sill.

1.2 REFERENCES

- A. ASTM A480 - Flat Rolled Stainless Heat Resisting Steel Plate, Sheet, and Strip.
- B. ASTM A653 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron, Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- C. ASTM A924 - General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
- D. UL - Underwriters' Laboratories, Inc.

1.3 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 01 33 00.
- B. Provide pertinent dimensioning, general construction, component connections and details, anchorage methods, hardware location, and installation details.
- C. Submit manufacturer's installation instructions under provisions of Section 01 33 00.

1.4 OPERATION AND MAINTENANCE DATA

- A. Submit manufacturer's operation and maintenance data under provisions of Section 01 77 00.

2. PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS - COUNTER SERVICE DOORS

- A. The Cookson Co., www.cooksondoor.com.
- B. Overhead Door Corp., www.overheaddoor.com.
- C. Raynor, www.raynor.com.
- D. Substitutions: Under provisions of Section 01 25 13.

2.2 MATERIALS - OVERHEAD COILING DOORS

- A. Curtain: Minimum 0.0269 inch thick flat slats of steel, ASTM A653, Commercial Steel, Type A, G60 galvanized coating in accordance with ASTM A924; 2-1/4 inches nominal width x required length; ends of alternate slats fitted with endlocks to act as wearing surface in guides and to prevent lateral movement; bottom fitted with angles to provide reinforcement and positive contact with floor in closed position
- B. Curtain Guides: Formed steel channels and angles for required sizes and configurations.
- C. Roller Shaft (Counterbalance): Steel pipe and helical steel spring system capable of producing sufficient torque to assure easy operation of curtain from any position; adjustable spring tension.
- D. Housing: 0.020 inch thick galvanized steel; internally reinforced to maintain rigidity and form.

- E. Weatherstripping: Water and rot proof, resilient type; located along jamb edges, bottom of curtain, and within housing.
- F. Hardware: As specified in Section 08 71 00.
- G. Chain Hoist Operation: Continuous hand chain hoist with gear reduction.

2.3 MATERIALS - COUNTER SERVICE DOORS

- A. Curtain: ASTM A480, 0.031 inch thick Type 304 stainless steel flat slats fitted with endlocks to maintain proper alignment; stainless steel angle bottom bar with lift handles and slide bolts to lock curtain closed at each jamb.
- B. Frame: ASTM A480, 0.063 inch thick Type 304 stainless steel frame, hood and fascia with grooves formed into jambs for retaining curtain.
- C. Sill: 2 inch thick x 0.078 inch thick Type 304 stainless steel sill. Size and rectangular configuration made for opening size and wall configuration.
- D. Roller Shaft (Counterbalance): Steel pipe and helical steel spring system capable of producing sufficient torque to assure easy operation of curtain from any position; adjustable spring tension.
- E. Operation: Crank operated.

2.4 FINISH

- A. Counter Service Doors: Stainless steel, No. 4 finish.

3. PART 3 EXECUTION

3.1 INSTALLATION

- A. Install counter service doors in accordance with manufacturer's instructions.
- B. Fit, align, and adjust door assemblies level and plumb; provide smooth operation.
- C. Test door closing when activated by smoke-detector fire-release system. Reset door-closing mechanism after successful test.

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE

1. PART 1 GENERAL

1.1 Related Documents

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions of Division 1 Specification Sections, apply to this Section.

1.2 Summary

- A. This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.
- B. This Section includes the following, but is not necessarily limited to:
 - 1. Door Hardware, including electric hardware.
 - 2. Thresholds, gasketing and weather-stripping.
 - 3. Door silencers or mutes.
- C. Related Sections: The following sections are noted as containing requirements that relate to this Section, but may not be limited to this listing.
 - 1. Division 8: Section - Steel Doors and Frames.
 - 2. Division 28: Section - Fire/Life-Safety Systems

1.3 REFERENCES (Use Date Of Standard In Effect As Of Bid Date.)

- A. 2019 California Building Code, CCR, Title 24.
- B. BHMA – Builders' Hardware Manufacturers Association
- C. CCR – California Code of Regulations, Title 24, Part 2, California State Accessibility Standards.
- D. DHI – Door and Hardware Institute
- E. NFPA - National Fire Protection Association.
 - 1. NFPA 80 - Fire Doors and Other Opening Protectives
 - 2. NFPA 105 - Smoke and Draft Control Door Assemblies
- F. UL - Underwriters Laboratories.
 - 1. UL 10C - Fire Tests of Door Assemblies
 - 2. UL 305 - Panic Hardware
- G. WHI - Warnock Hersey Incorporated
- H. SDI - Steel Door Institute

1.4 Submittals & Substitutions

- A. General: Submit in accordance with Conditions of the Contract and Division 1 Specification sections.
- B. Submit product data (catalog cuts) including manufacturers' technical product information for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.

- C. Submit six (6) copies of schedule organized vertically into "Hardware Sets" with index of doors and headings, indicating complete designations of every item required for each door or opening. Include following information:
1. Include a Cover Sheet with;
 - a. Job Name, location, telephone number.
 - b. Architects name, location and telephone number.
 - c. Contractors name, location, telephone number and job number.
 - d. Suppliers name, location, telephone number and job number.
 - e. Hardware consultant's name, location and telephone number.
 2. Job Index information included;
 - a. Numerical door number index including; door number, hardware heading number and page number.
 - b. Complete keying information (referred to DHI hand-book "Keying Systems and Nomenclature"). Provision should be made in the schedule to provide keying information when available; if it is not available at the time the preliminary schedule is submitted.
 - c. Manufacturers' names and abbreviations for all materials.
 - d. Explanation of abbreviations, symbols, and codes used in the schedule.
 - e. Mounting locations for hardware.
 - f. Clarification statements or questions.
 - g. Catalog cuts and manufacturer's technical data and instructions.
 3. Vertical schedule format sample:

Heading Number 1 (Hardware group or set number – HW -1)					
			(a) 1 Single Door #1 - Exterior from Corridor 101	(b) 90°	(c) RH
			(d) 3' 0"x7' 0" x 1-3/4" x (e) 20 Minute (f) WD x HM		
(g) 1	(h)	(i) ea	(j) Hinges - (k) 5BB1HW 4.5 x 4.5 NRP (l) ½ TMS	(m) 626	(n) IVE
2	6AA	1 ea	Lockset - ND50PD x RHO x RH x 10-025 x JTMS	626	SCH

(a) - Single or pair with opening number and location. (b) - Degree of opening (c) - Hand of door(s)
 (d) - Door and frame dimensions and door thickness. (e) - Label requirements if any. (f) - Door by frame material. (g) - (Optional) Hardware item line #. (h) - Keyset Symbol. (i) - Quantity. (j) - Product description. (k) - Product Number. (l) - Fastenings and other pertinent information. (m) - Hardware finish codes per ANSI A156.18. (n) - Manufacture abbreviation.

- D. Make substitution requests in accordance with Division 1. Substitution requests must be made prior to bid date. Include product data and indicate benefit to the project. Furnish samples of any proposed substitution.
- E. Wiring Diagrams: Provide product data and wiring and riser diagrams for all electrical products listed in the Hardware Schedule portion of this section.
- F. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.

- G. Templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- H. Furnish as-built/as-installed schedule with close-out documents, including keying schedule and transcript, wiring/riser diagrams, manufacturers' installation and adjustment and maintenance information.
- I. Fire Door Assembly Testing: Submit a written record of each fire door assembly to the Owner to be made available to the Authority Having Jurisdiction (AHJ) for future building inspections.

1.5 Quality Assurance

- A. Obtain each type of hardware (latch and lock sets, hinges, closers, exit devices, etc.) from a single manufacturer.
- B. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this project and that employs an experienced architectural hardware consultant (AHC) who is available to Owner, Architect, and Contractor, at reasonable times during the course of the Work, for consultation.
 - 1. Responsible for detailing, scheduling and ordering of finish hardware.
 - 2. Meet with Owner to finalize keying requirements and to obtain final instructions in writing. To maintain the integrity of patented key systems provide a letter of authorization from the specified manufacturer indicating that supplier has authorization to purchase the key system directly from the manufacturer.
 - 3. Stock parts for products supplied and are capable of repairing and replacing hardware items found defective within warranty periods.
- C. Hardware Installer: Company specializing in the installation of commercial door hardware with five years documented experience.
- D. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and tested by UL or Warnock Hersey for given type/size opening and degree of label. Provide proper latching hardware, door closers, approved-bearing hinges and seals whether listed in the Hardware Schedule or not.
 - 1. Where emergency exit devices are required on fire-rated doors, (with supplementary marking on doors' UL labels indicating "Fire Door to be Equipped with Fire Exit Hardware") provide UL label on exit devices indicating "Fire Exit Hardware".
- E. Exit Doors: Operable from inside with single motion without the use of a key or special knowledge or effort.
- F. Product packaging to be labelled in compliance with CA Prop 65, Safe Drinking Water and Toxic Enforcement Act of 1986.

1.6 Delivery, Storage And Handling

- A. Coordinate delivery of packaged hardware items to the appropriate locations (shop or field) for installation.
- B. Hardware items shall be individually packaged in manufacturers' original containers, complete with proper fasteners. Clearly mark packages on outside to indicate contents and locations in hardware schedule and in work.
- C. Provide locked storage area for hardware, protect from moisture, sunlight, paint, chemicals, etc.
- D. Contractor to inventory door hardware jointly with representatives of hardware supplier and hardware installer until each all are satisfied that count is correct.

1.7 Warranty

- A. Provide warranties of respective manufacturers' regular terms of sale from day of final acceptance as follows:
1. "ND" Ten (10) years.
 2. Closers: Thirty (30) years
 3. Exit devices: Three (3) years.
 4. All other hardware: Two (2) years.

1.8 Maintenance

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

1.9 Pre-Installation Conference

- A. Convene a pre-installation conference at least one week prior to beginning work of this section.
- B. Attendance: Architect, Construction Manager, Contractor, Security Contractor, Hardware Supplier, Installer, Key Owner Personnel, and Project Inspector.
- C. Agenda: Review hardware schedule, products, installation procedures and coordination required with related work. Review Owner's keying standards.

2. PART 2 PRODUCTS

2.1 Manufacturers

<u>Item</u>	<u>Manufacturer</u>	<u>Acceptable Substitutes</u>
Butt Hinges	Ives	Hager
Locks, Latches & Cylinders	Schlage	Or Approved Equal
Exit Devices	Von Duprin	Or Approved Equal
Closers	LCN	Or Approved Equal
Push, Pulls & Protection Plates	Ives	Trimco, DCI
Flush Bolts	Ives	Trimco, DCI
Dust Proof Strikes	Ives	Trimco, DCI
Stops	Ives	Trimco, DCI
Thresholds	Zero	NGP, Pemko
Seals & Bottoms	Zero	NGP, Pemko

2.2 Materials

- A. Hinges: Exterior out-swinging door butts shall be non-ferrous material and shall have stainless steel hinge pins. All doors to have non-rising pins.
1. Hinges shall be sized in accordance with the following:
 - a. Height:
 - 1) Doors up to 42" wide: 4-1/2" inches.
 - 2) Doors 43" to 48" wide: 5 inches.
 - b. Width: Sufficient to clear frame and trim when door swings 180 degrees.

- c. Number of Hinges: Furnish 3 hinges per leaf to 7'-5" in height. Add one for each additional 2 feet in height.
 - 2. Furnish non-removable pins (NRP) at all exterior out-swing doors and interior key lock doors with reverse bevels.
- B. Heavy Duty Cylindrical Locks and Latches: Schlage "ND" Series as scheduled with "Rhodes" design, fastened with through-bolts and threaded chassis hubs.
 - 1. Provide cylindrical locksets exceeding the ANSI/BHMA A156.2 Grade 1 performance standards for strength, security, and durability in the categories below:
 - a. Abusive Locked Lever Torque Test – minimum 3,100 inch-pounds without gaining access
 - b. Offset lever pull – minimum 1,600 foot pounds without gaining access
 - c. Vertical lever impact – minimum 100 impacts without gaining access
 - 2. Cycle life - tested to minimum 16 million cycles per ANSI/BHMA A156.2 Cycle Test with no visible lever sag or use of performance aids such as set screws or spacers
 - 3. UL 10C for 4'-0" x 10'-0" 3-hour fire door.
 - 4. Cylinders: Refer to "KEYING" article, herein.
 - 5. Provide solid steel anti-rotation through bolts and posts to control excessive rotation of lever.
 - 6. Provide lockset that allows lock function to be changed to over twenty other common functions by swapping easily accessible parts.
 - 7. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2 inch latch throw capable of UL listing of 3 hours on a 4' x 10' opening. Provide proper latch throw for UL listing at pairs.
 - 8. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
 - 9. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
 - 10. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
 - 11. Lever Trim: Solid cast levers without plastic inserts, and wrought roses on both sides.
- C. Schlage "L" Series as scheduled with "06" Style Lever and "A" Style Rose.
 - 1. Locksets to comply with ANSI A156.13, Series 1000, Operational Grade 1 and Security Grade 1 with all standard trims. Locksets shall also comply with UL10C Positive Pressure requirements
 - 2. Lock case shall be manufactured with heavy 12 gauge steel with fully wrapped design. Lock cases with exposed edges are not acceptable. Lock case shall be multi-functional allowing transformation to a different function without opening lock case.
 - 3. Latchbolt shall have 3/4" throw and be non-handed, field reversible without opening the lock case. Solid latchbolts and / or plastic anti-friction devices are not acceptable.
 - 4. The deadbolt, when used, shall be 1" throw stainless steel with a 3/4" internal engagement when fully extended.
 - 5. All trim shall be through-bolted with the spring cages supporting the trim attached to the lock cases to prevent torqueing.
 - 6. Levers to have independent rotation in both directions. Exterior lever assembly to be one-piece design attached by threaded bushing. Interior lever assembly shall be attached by screwless shank

7. Thru-bolt lever assemblies through the door for positive interlock. Locks using a through the door spindle for attachment are not acceptable. Spindles shall be independent, designed to "break-away" at a maximum of 75psi torque.
 8. Hand of lock chassis to be changeable by simply moving one screw from one side to the case to the other and pulling and reversing the latchbolt.
 9. Cylinders to be secured by a cast stainless steel, dual retainer. Locks utilizing screws and / or stamped retainers are not acceptable.
- D. Closers: LCN as scheduled. Place closers inside building, stairs, room, etc.
1. Door closer cylinders shall be of high strength cast iron construction with double heat treated pinion shaft to provide low wear operating capabilities of internal parts throughout the life of the installation. All door closers shall be tested to ANSI/BHMA A156.4 test requirements by a BHMA certified testing laboratory. A written certification showing successful completion of a minimum of 10,000,000 cycles must be provided.
 2. All door closers shall be fully hydraulic and have full rack and pinion action with a shaft diameter of a minimum of 11/16 inch and piston diameter of 1 inch to ensure longevity and durability under all closer applications.
 3. All parallel arm closers shall incorporate one piece solid forged steel arms with bronze bushings. 1-9/16" steel stud shoulder bolts, shall be incorporated in regular arms, hold-open arms, arms with hold open and stop built in. All other closers to have forged steel main arms for strength, durability, and aesthetics for versatility of trim accommodation, high strength and long life.
 4. All parallel arm closers so detailed shall provide advanced backcheck for doors subject to severe abuse or extreme wind conditions. This advanced backcheck shall be located to begin cushioning the opening swing of the door at approximately 45 degrees. The intensity of the backcheck shall be fully adjustable by tamper resistant non-critical screw valve.
 5. Closers shall be installed to permit doors to swing 180 degrees.
 6. All closers shall utilize a stable fluid withstanding temperature range of 120 degrees F. to - 30 degrees F. without requiring seasonal adjustment of closer speed to properly close the door.
 7. Provide the manufactures drop plates, brackets and spacers as required at narrow head rails and special frame conditions. NO wood plates or spacers will be allowed.
 8. Maximum effort to operate closers shall not exceed 5 lbs., such pull or push effort being applied at right angles to hinged doors. Compensating devices or automatic door operators may be utilized to meet the above standards. When fire doors are required, the maximum effort to operate the closer may be increased but shall not exceed 15 lbs. when specifically approved by fire marshal. All closers shall be adjusted to operate with the minimum amount of opening force and still close and latch the door. These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position. Per 11B-404.2.8.1, door shall take at least 5 seconds to move from an open position of 90 degrees to a position of 12 degrees from the latch jamb.
- E. Door Stops:
1. Unless otherwise noted in Hardware Sets, provide floor type with appropriate fasteners. Where wall type cannot be used, provide floor type. If neither can be used, provide overhead type.
 2. Do not install floor stops more than four (4) inches from the face of the wall or partition (CBC Section 11B-307).
 3. Overhead stops shall be made of stainless steel and non-plastic mechanisms and finished metal end caps. Field-changeable hold-open, friction and stop-only functions.
- F. Protection Plates: Fabricate either kick, armor, or mop plates with four beveled edges. Provide kick plates 10" high and 2" LDW. Sizes of armor and mop plates shall be listed in the Hardware Schedule. Furnish with machine or wood screws of bronze or stainless to match other hardware.
- G. Thresholds: As Scheduled and per details.
1. Thresholds shall not exceed 1/2" in height, with a beveled surface of 1:2 maximum slope.
 2. Set thresholds in a full bed of butyl-rubber or polyisobutylene mastic sealant complying with requirements in Division 7 "Thermal and Moisture Protection".

3. Use 1/4" fasteners, red-head flat-head sleeve anchors (SS/FHSL).
 4. Thresholds shall comply with CBC Section 11B-404.2.5.
- H. Seals: Provide silicone gasket at all rated and exterior doors.
1. Fire-rated Doors, Resilient Seals: UL10C Classified complies with NFPA 80 & NFPA 252. Coordinate with selected door manufacturers' and selected frame manufacturers' requirements.
 2. Fire-rated Doors, Intumescent Seals: Furnished by selected door manufacturer. Furnish fire-labeled opening assembly complete and in full compliance with UL10C Classified complies with NFPA 80 & NFPA 252. Where required, intumescent seals vary in requirement by door type and door manufacture -- careful coordination required.
 3. Smoke & Draft Control Doors, Provide UL10C Classified complies with NFPA 80 & NFPA 252 for use on "S" labeled Positive Pressure door assemblies.
- I. Door Shoes & Door Top Caps: Provide door shoes at all exterior wood doors and top caps at all exterior out-swing doors.
- J. Silencers: Furnish silencers for interior hollow metal frames, 3 for single doors, 2 for pairs of doors. Omit where sound or light seals occurs, or for fire-resistive-rated door assemblies.

2.3 Keying

- A. Furnish a Proprietary Schlage masterkey system as directed by the owner or architect. Key system to be designated and combined by the Schlage Master Key Department even if pinned by the Authorized Key Center, Authorized Security Center or a local authorized commercial dealer.
- B. A detailed keying schedule is to be prepared by the owner and/or architect in consultation with a representative of Allegion or an Authorized Key Center or Authorized Security Center. Each keyed cylinder on every keyed lock is to be listed separately showing the door #, key group (in BHMA terminology), cylinder type, finish and location on the door.
- C. Extend the original Schlage masterkey system established for the City of Rohnert Park
- D. Furnish all cylinders in the Schlage conventional style except the exit device and removable mullion cylinders which will be supplied in Schlage Full Size Interchangeable Core (FSIC). Pack change keys independently (PKI).
- E. Furnish construction keying for doors requiring locking during construction.
- F. Furnish all keys with visual key control.
 1. Stamp key "Do Not Duplicate".
 2. Stamp unique owner identifier from the key bow.
 3. Delete key section identifier from the key bow.
 4. Delete key "bitting" from the key bow.
- G. Furnish all cylinders with visual key control
 1. Stamp (BHMA) key symbol on side of cylinder (CKC).
- H. Furnish mechanical keys as follows:
 1. Furnish 2 cut change keys for each different change key code.
 2. Furnish 1 uncut key blank for each change key code.
 3. Furnish 6 cut masterkeys for each different masterkey set.
 4. Furnish 3 uncut key blanks for each masterkey set.

5. Furnish 2 cut control keys cut to the top masterkey for permanent I/C cylinders.
 6. Furnish 1 cut control key cut to each SKD combination.
 7. Furnish KS43D2200 padlock for use with non-I/C Schlage cylinders. Furnish 47-413 (conventional) or 47-743-XP (PrimusXP) with above.
 8. Furnish KS43G3200 padlock for use with FSIC Schlage cylinders. Furnish 23-030 (Classic / Everest) or 20-740 (PrimusXP) with above.
 9. Furnish KS41D1200 padlock for use with SFIC Schlage cylinders. Furnish 80-037 (Everest-B) with above.
- I. Furnish Schlage Padlocks and the cylinders to tie them into the masterkey system for gates, storage boxes, utility valve security, roof hatches and roll-up doors keyed as directed in the keying schedule.
1. Furnish KS43D2200 padlock for use with non-I/C Schlage cylinders. Furnish 47-413 (conventional) or 47-743-XP (PrimusXP) with above.
 2. Furnish KS43G3200 padlock for use with FSIC Schlage cylinders. Furnish 23-030 (Classic / Everest) or 20-740 (PrimusXP) with above.
 3. Furnish KS41D1200 padlock for use with SFIC Schlage cylinders. Furnish 80-037 (Everest-B) with above.
- J. Furnish one Schlage cabinet lock for each cabinet door or drawer so designated on the drawings or keying schedule to match the masterkey system.
1. Furnish CL771R for use with FSIC Schlage cylinders.

2.4 Finishes

- A. Generally to be satin stainless steel US32D (630) unless otherwise noted.
- B. Door closers shall be powder-coated to match other hardware, unless otherwise noted.
- C. Aluminum items to be finished anodized aluminum except thresholds which can be furnished as standard mill finish.

2.5 Fasteners

- A. Screws for strikes, face plates and similar items shall be flat head, countersunk type, provide machine screws for metal and standard wood screws for wood.
- B. Screws for butt hinges shall be flathead, countersunk, full-thread type.
- C. Fastening of closer bases or closer shoes to doors shall be by means of sex bolts and spray painted to match closer finish.
- D. Provide expansion anchors for attaching hardware items to concrete.
- E. All exposed fasteners shall have a phillips head.
- F. Finish of exposed screws to match surface finish of hardware or other adjacent work.
- G. All Exit Devices and Lock Protectors shall be fastened to the door by the means of sex bolts or through bolts.

3. PART 3 EXECUTION

3.1 Inspection

- A. Verify that doors and frames are square and plumb and ready to receive work and dimensions are as instructed by the manufacturer.
- B. Beginning of installation means acceptance of existing conditions.

3.2 Installation

- A. Install hardware in accordance with manufacturer's instructions and requirements of DHI.
- B. Use the templates provided by hardware item manufacturer.
- C. Mounting heights for hardware shall be as recommended by the Door and Hardware Institute. Operating hardware will to be located between 34" and 44" AFF.
- D. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- E. Drill and countersink units that are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- F. Set thresholds for exterior doors in full bed of butyl-rubber sealant.
- G. If hand of door is changed during construction, make necessary changes in hardware at no additional cost.

3.3 Adjust And Clean

- 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 as intended for the application made.
- B. Clean adjacent surface soiled by hardware installation.
- C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy, return to that work area and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- D. Instruct Owner's Personnel in proper adjustment and maintenance of hardware finishes, during the final adjustment of hardware.
- E. Continued Maintenance Service: Approximately six months after the completion of the project, the Contractor accompanied by the Architectural Hardware Consultant, shall return to the project and re-adjust every item of hardware to restore proper functions of doors and hardware. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures. Replace hardware items which have deteriorated or failed due to faulty design, materials or installation of hardware units. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

3.4 Hardware Locations

- A. Conform to CCR, Title 24, Part 2; and ADAAG; and the drawings for access-compliant positioning requirements for the disabled.

3.5 Field Quality Control

- A. Contractor is responsible for providing the services of an Architectural Hardware Consultant (AHC) or a proprietary product technician to inspect installation and certify that hardware and its installation have been furnished and installed in accordance with manufacturers' instructions and as specified herein.

3.6 Schedule

- A. The items listed in the following schedule shall conform to the requirements of the foregoing specifications.
- B. While the hardware schedule is intended to cover all doors, and other movable parts of the building, and establish type and standard of quality, the contractor is responsible for examining the Plans and Specifications and furnishing proper hardware for all openings whether listed or not. If there are any omissions in hardware groups in regard to regular doors they shall be called to the attention of the Architect prior to bid opening for instruction; otherwise, list will be considered Complete. No extras will be allowed for omissions.
- C. The Door Schedule on the Drawings indicates which hardware set is used with each door.

Manufacturers Abbreviations (Mfr.)

IVE	=	Ives	Hinges, Pivots, Bolts, Coordinators, Dust Proof Strikes, Push Pull & Kick Plates, Door Stops & Silencers
GLY	=	Glynn Johnson	Overhead Stops
LCN	=	LCN	Door Closers
SCH	=	Schlage Lock Company	Locks, Latches & Cylinders
ZER	=	Zero International	Thresholds, Gasketing & Weather-stripping

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GROUP NO. 01

1	EA	CONT. HINGE	700	630	IVE
1	EA	CLASSROOM DEAD LOCK	L463P6	630	SCH
1	EA	PUSH PLATE	8200 6" X 16"	630	IVE
1	EA	PULL PLATE	8302 10" 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4111 EDA SRI	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP/HOLDER	WS40	626	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	PER DETAIL	A	ZER

GROUP NO. 02

3	EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	EA	STOREROOM LOCK	LV9080P6 06A	630	SCH
1	EA	OH STOP & HOLDER	90H	630	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	PER DETAIL	A	ZER

GROUP NO. 03

4	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	DUTCH DOOR BOLT	054	626	IVE
1	EA	VANDL CLASSROOM LOCK	ND94P6D RHO	626	SCH
1	EA	OH STOP & HOLDER	90H	630	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	FLOOR STOP	FS18S	BLK	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	PER DETAIL	A	ZER

GROUP NO. 04

3	EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	EA	CORRIDOR W/DEADBOLT	LV9456P6 06A L583-363	630	SCH
1	EA	SURFACE CLOSER	4111 SCUSH SRI	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	PER DETAIL	A	ZER

GROUP NO. 05

3	EA	HINGE	5BB1 4.5 X 4.5	630	IVE
1	EA	OFFICE W/SIM RETRACT	L9056P6 06A L583-363	630	SCH
1	EA	FLOOR STOP	FS439	682	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER

END OF SECTION

SECTION 09 21 16

GYPSUM BOARD ASSEMBLIES

1. PART 1 GENERAL

1.1 WORK INCLUDED

- A. Gypsum board.
- B. Taped and sanded joint treatment.
- C. Surface primer.
- D. Resilient furring channels.

1.2 REFERENCES

- A. ASTM C11 - Standard Terminology Relating to Gypsum and Related Building Materials and Systems.
- B. ASTM C79 - Standard Specification for Treated Core and Nontreated Core Gypsum Sheathing Board.
- C. ASTM C475 - Joint Treatment Materials for Gypsum Wallboard Construction.
- D. ASTM C514 - Nails for the Application of Gypsum Wallboard.
- E. ASTM C557 - Adhesives for Fastening Gypsum Wallboard to Wood Framing.
- F. ASTM C645 - Non-Load (Axial) Bearing Steel Studs, Runners (Track), and Rigid Furring Channels for Screw Application of Gypsum Board.
- G. ASTM C754 - Installation of Steel Framing Members to Receive Screw Attached Gypsum Wallboard, Backing Board, or Water Resistant Backing Board.
- H. ASTM C840 - Application and Finishing of Gypsum Board.
- I. ASTM C919 - Use of Sealants in Acoustical Applications.
- J. ASTM C1002 - Steel Drill Screws for the Application of Gypsum Board.
- K. ASTM C1177 - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
- L. ASTM C1396 - Standard Specification for Gypsum Board.
- M. ASTM C1629 - Standard Specification for the Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels.
- N. ASTM D226 - Asphalt-Saturated Felt Used in Roofing and Waterproofing.
- O. ASTM D1037 - Test Methods for Evaluating Properties of Wood-Based Fiber and Particle Panel Materials.
- P. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
- Q. ASTM D3274 - Standard Test Method for Evaluating Degree of Surface Disfiguration of Paint Films in Fungal or Algal Growth, or Soil and Dirt Accumulation.
- R. ASTM D4977 - Standard Test Method for Granular Adhesion to Mineral Surfaced Roofing by abrasion (modified).
- S. ASTM D5420 - Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact).

- T. ASTM E90 - Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
- U. ASTM E695 - Standard Method of Measuring Relative Resistance of Wall, Floor, and Roof Construction to Impact Loading.
- V. CBC - California Building Code, (CCR) California Code of Regulations, Title 24, Part 2.
- W. GA 201 - Using Gypsum Board for Walls and Ceilings.
- X. GA 214 - Levels of Gypsum Board Finish.
- Y. GA 216 - Application and Finishing of Gypsum Board.
- Z. GA 253 - Application of Gypsum Sheathing.
- AA. ISO 14040 - Environmental Management - Life cycle assessment - Principals and Framework.
- BB. UL - Underwriters Laboratories.

1.3 QUALITY ASSURANCE

- A. Applicator: Company specializing in gypsum board systems work with five years documented experience.

1.4 REGULATORY REQUIREMENTS

- A. Conform to CBC, California Building Code, (CCR) California Code of Regulations, Title 24, Part 2, Chapter 7, and UL and GA requirements for fire rated assemblies as indicated on the drawings

1.5 ACOUSTICAL PERFORMANCE

- A. Acoustical Attenuation for Identified Interior Partitions: 39 STC in accordance with ASTM E90.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Maintain uniform temperature of minimum 60 degrees F and humidity of 30 to 50 percent prior to, during, and after installation of the Work of this Section.

1.7 DEFINITIONS

- A. Refer to ASTM C11 for definitions of terms related to gypsum board assemblies.

1.8 FIELD SAMPLES

- A. Provide field samples under provisions of Section 01 33 00.
- B. On wall and ceiling surface duplicate specified texture finish on at least 100 sq.ft. of surface area.
- C. Provide complete finish including surface primer.
- D. Simulate finished lighting conditions for review of field sample.
- E. After surface texture is accepted, the accepted surface will remain as part of the Work and will be used to evaluate subsequent applications of finish texture.

2. PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS - GYPSUM BOARD SYSTEM

- A. American Gypsum Corp., www.americangypsum.com.
- B. Certainteed, www.certainteed.com.

- C. Georgia Pacific Corp., www.gp.com.
- D. National Gypsum Co., www.nationalgypsum.com.
- E. PABCO Gypsum, www.pabco gypsum.com.
- F. United States Gypsum Co., www.usg.com.
- G. Substitutions: Under provisions of Section 01 25 13.

2.2 FRAMING MATERIALS

- A. Fasteners: ASTM C1002.
- B. Adhesive: ASTM C557.

2.3 GYPSUM BOARD MATERIALS

- A. Standard Gypsum Board: ASTM C1396; 5/8 inch thick unless otherwise indicated, maximum permissible length; ends square cut, tapered and beveled edges. Similar to Sheetrock Brand EcoSmart Panels manufactured by United States Gypsum Company.
- B. Mold and Mildew Resistant Gypsum Board: ASTM C1396; 5/8 inches thick unless otherwise indicated, maximum length; ends square cut, tapered and beveled edges. Mold and mildew resistant core and paper facing, meeting ASTM D3273, with a score of 10 as rated according to ASTM D3274. Similar to Sheetrock Brand EcoSmart Mold Tough Panels manufactured by United States Gypsum Company.
- C. Moisture Resistant Gypsum Board: ASTM C1396 with a score of 10 as rated according to ASTM D3274; 5/8 inch thick unless otherwise indicated, water resistant core; water resistant paper on front, back, and long edges; maximum permissible length; ends square cut, tapered and beveled edges.

2.4 ACCESSORIES

- A. Acoustical Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board: As specified in Section 07 92 00.
- B. Corner Beads: Metal, hot dip galvanized.
- C. Edge Trim: GA 201 and GA 216; Type LC bead, unless otherwise indicated.
- D. Control Joints: Roll-formed zinc, Type USG No. 093.
- E. Spot Grout: ASTM C475, setting-type joint compound.
- F. Joint Materials Interior: ASTM C475; reinforcing tape, joint compound, adhesive, water, and fasteners. Use tapes and compound recommended by gypsum board manufacturer for the use intended. Use ready mixed, drying type compounds. Use taping compound for embedding tape and first coat over fasteners and flanges of corner beads and trim. Use topping compound for fill and finish coats.
- G. Primer: Flat latex basecoat paint equivalent to First Coat manufactured by United States Gypsum Company.
- H. Primer-Surfacer: Vinyl acrylic latex-based primer and surfacer equivalent to Tuff-Hide manufactured by United States Gypsum Company.
- I. Membrane: ASTM D226; No. 15 asphalt saturated roofing felt.

3. PART 3 EXECUTION

3.1 INSPECTION

- A. Verify that site conditions are ready to receive Work.
- B. Beginning of installation means acceptance of substrate.

3.2 WALL FURRING INSTALLATION

- A. Erect metal furring vertically at 16 inches o.c. Secure in place on alternate channel flanges at maximum 24 inches o.c.

3.3 ACOUSTICAL ACCESSORIES INSTALLATION

- A. Space resilient furring channels horizontally at maximum 16 inches o.c., not more than 2 inches from floor and ceiling lines.
- B. Locate nested joints over framing members.
- C. Install acoustical sealant within partitions in accordance with manufacturer's instructions and ASTM C919.
- D. Seal perimeter, joints, openings and penetrations on each face of partition.

3.4 CEILING FRAMING INSTALLATION

- A. Install in accordance with ASTM C754 and CBC, California Building Code, (CCR) California Code of Regulations, Title 24, Part 2, Chapter 25.
- B. Coordinate locations of hangers with other Work.
- C. Install ceiling framing independent of walls and columns.
- D. Space 9 gauge hanger wires 3'-0" o.c. along 1-1/2 inch furring channels and within 6 inches of end of furring channel.
- E. Install 1-1/2 inch furring channels at 4'-0" o.c. and within 6 inches of parallel walls. Provide 1 inch clearance between end of channels and abutting walls.
- F. Position furring channels for proper ceiling height, level, and secure with hanger wire saddle-tied along channel.
- G. At channel splices, interlock flanges, overlap ends 12 inches and secure each end with double-strand of 16 gauge tie wire.
- H. Erect metal furring at right angles to 1-1/2 inch furring channels. Space metal furring 16 inches o.c.
- I. Install metal furring within 6 inches of parallel walls. Provide 1 inch clearance between end of furring and abutting wall.
- J. Secure metal furring to furring channel with clips or saddle tie with double strand of 18 gauge tie wire.
- K. At splices of metal furring nest furring at least 8 inches and securely wire-tie each end with double strand of 16 gauge tie-wire.
- L. Reinforce openings in ceiling suspension system which interrupt main furring channels or metal furring with lateral channel bracing. Extend bracing minimum 24 inches past each end of openings.

3.5 MEMBRANE INSTALLATION

- A. Install membrane over wall studding where moisture resistant gypsum board is to be installed.
- B. Install membrane over substrate; weatherlap horizontal edges 4 inches and vertical edges 6 inches.

3.6 GYPSUM BOARD INSTALLATION

- A. Install gypsum board in accordance with ASTM C840 and manufacturer's instructions.
- B. Erect single layer standard gypsum board in most economical direction, with ends and edges occurring over firm bearing except those ends and edges which are perpendicular to framing.
- C. Erect single layer fire rated gypsum board vertically, with edges and ends occurring over firm bearing except those ends and edges which are perpendicular to framing members. Comply with required UL, CBC, or GA fire rated assembly.
- D. Erect double layer gypsum board with standard gypsum board for first layer placed in most economical direction with second layer placed parallel to face layer with adhesive and supplementary fasteners. Off-set joints of second layer from joints of first layer by at least 12 inches.
- E. Erect double layer fire rated gypsum board in accordance with required UL, CBC, or GA fire rated assembly.
- F. Use screws when fastening gypsum board to metal furring.
- G. Use screws when fastening gypsum board to wood furring or framing except where nails are required for UL or UBC fire rated assembly.
- H. Install acoustical sealant at wall penetrations and terminations as specified in this section and in accordance with Section 07 92 00.
- I. Isolate perimeter of gypsum board applied to non-load bearing partitions at structural abutments. Provide 1/2 inch wide space and trim with metal edge. Seal joint between metal edge and structural surface with acoustical sealant.
- J. Where partitions intersect structural members projecting below underside of floor / roof slabs and decks, cut gypsum panels to fit profile formed by structural member. Allow 1/2 inch wide space and install acoustical sealant.
- K. Treat cut edges and holes in moisture resistant gypsum board with sealant.
- L. Install gypsum board with mold and mildew-resistant core and paper facing at exterior locations on the interior face of all exterior walls.
- M. Place corner beads at external corners. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials.
- N. Spot grout metal door frames. Apply spot grout at each jamb anchor clip just before inserting board into frame.

3.7 JOINT TREATMENT

- A. Tape, fill, and sand joints, edges, and corners in accordance with GA-214.
- B. Feather successive coats a minimum of 2 inches onto adjoining surfaces for each coat.
- C. Where fire resistance rating is required, detail of joint treatment shall meet fire rating requirement.

D. Level 2 Treatment:

1. All joints and angles shall have tape embedded in joint compound and one separate coat of joint compound shall be applied over all fastener heads and accessories.
2. Surface shall be free of excess joint compound.
3. Tool marks and ridges are acceptable.
4. Use where surface is substrate to fiber reinforced plastic panel.

E. Level 3 Treatment:

1. Not used.

F. Level 5 Treatment:

1. All joints and angles shall have tape embedded in joint compound with three separate coats of topping compound applied over all joints, fasteners, and accessories.
2. Apply two coats of primer-surfacer over entire surface area to a minimum wet film thickness of 15 mils.
3. All compound shall be smooth and free of tool marks and ridges.
4. Sand lightly between coats.
5. Use for all surfaces that are scheduled to receive a painted finish in restrooms and shower areas.

3.8 FINISHING

- A. Roller apply surface primer to all gypsum board surfaces scheduled to receive a painted and textured finish prior to application of paint or texture finish.
- B. Spray apply textured finish to all surfaces scheduled to receive a paint finish except surfaces of food service and preparation areas.
- C. Remove any overspray of texture finish from door frames, windows, and other adjoining construction.

3.9 TOLERANCES

- A. Maximum Variation from True Flatness: 1/8 inch in 10 feet in any direction.

3.10 RECYCLING CONSTRUCTION WASTE

- A. Recycle gypsum board waste under the provisions of Section 01 74 19.

3.11 PROTECTION

- A. Protect adjacent surfaces from joint compound. Promptly remove from floors and other surfaces. Repair stained and marred surfaces damaged during gypsum board application.
- B. Protect work of this section from weather, condensation, direct sunlight, and other detrimental causes during the construction period.
- C. Remove and replace gypsum panels that become wet, moisture damaged and mold damaged.

END OF SECTION

SECTION 09 30 15

PORCELAIN TILE WALL FINISHING

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Porcelain tile wall finish using the thinset application method.
- B. Cementitious backing board.

1.2 REFERENCES

- A. ANSI/TCA A108.5 - Ceramic Tile Installed with Dry-Set Portland Cement Mortar or Latex Portland Cement Mortar.
- B. ANSI/TCA A108.11 - Interior Installation of Cementitious Backer Units.
- C. ANSI/TCA A118.1 - Dry-Set Portland Cement Mortar.
- D. ANSI/TCA A118.4 - Latex-Portland Cement Mortar.
- E. ANSI/TCA A118.7 - Polymer Modified Ceramic Tile Grouts.
- F. ANSI/TCA A118.9 - Test Methods and Specifications for Cementitious Backer Units.
- G. ANSI/TCA A137.1 - Specifications for Ceramic Tile.
- H. ASTM C847 - Standard Specifications for Metal Lath.
- I. ASTM D226 - Asphalt-Saturated Felt Used in Roofing and Waterproofing.
- J. TCA (Tile Council of America) - Handbook for Ceramic Tile Installation.

1.3 SUBMITTALS

- A. Submit shop drawings under provisions of Section 01 33 00.
- B. Submit shop drawings indicating tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials.
- C. Submit samples under provisions of Section 01 33 00.
- D. Submit 4 samples of each tile, representative of pattern and color variations.
- E. Submit manufacturer's installation instructions under provisions of Section 01 33 00.
- F. Submit maintenance data under provisions of Section 01 77 00.
- G. Include recommended cleaning and stain removal methods, and cleaning materials.

1.4 QUALITY ASSURANCE

- A. Conform to ANSI/TCA A137.1 for tile material.
- B. Conform to ANSI/TCA Standards and TCA Handbook for tile installation.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in the manufacture of products specified in this Section with minimum five years documented experience.
- B. Installer: Company specializing in applying the work of this Section with minimum five years documented experience.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Maintain 50 degrees F during installation of mortar materials.

1.7 EXTRA MATERIALS

- A. Provide extra quantity of full size tile and trim shape units to Owner under provisions of Section 01 77 00.
- B. Provide quantity equal to 5 percent of units installed of each shape and color.

2. PART 2 PRODUCTS

2.1 MANUFACTURERS - TILE

- A. Roca Tile, www.tileusa.com, Phone (925) 286-9498.
- B. Crossville Ceramics, www.crossvilleinc.com.
- C. Dal-Tile Corp., www.daltile.com.
- D. Emser Tile, www.emser.com.
- E. Substitutions: Under provisions of Section 01 25 13.

2.2 TILE MATERIAL

- A. Porcelain Wall Tile: ANSI/TCA A137.1, conforming to the following:

Moisture Absorption	0 to 0.5 percent
Manufacturer and Pattern	Equivalent to Avila
Size	12 x 24 x 1/4 inch
Edge	Cushioned
Surface Finish	Matte
Color	As selected

- B. Brushed stainless steel 304 Wall Profile: Manufactured by Schluter ECK-E, Outside Corner, E37V2A.

2.3 MANUFACTURERS - MORTAR AND GROUT

- A. Custom Building Products, www.custombuildingproducts.com.
- B. Hydromet, www.bostikfindley.com.
- C. Laticrete International, Inc., www.laticrete.com.
- D. MAPEI, www.mapei.com.
- E. Substitutions: Under provisions of Section 01 25 13.

2.4 MORTAR MATERIALS

- A. Latex-Portland Cement Mortar: ANSI/TCA A118.4 and the following:
 - 1. Acrylic resin latex additive.
 - 2. Dry mortar mix supplied by latex manufacturer.

2.5 GROUT MATERIALS

- A. Portland Cement Grout Materials: ANSI/TCA A118.7.
- B. Latex-Portland Cement Grout: ANSI/TCA A118.7 of color selected and the following:
 - 1. Acrylic resin latex additive.
 - 2. Microban antimicrobial additive, www.microban.com.
 - 3. Dry mortar mix supplied by latex manufacturer.

2.6 ACCESSORIES

- A. Membrane: ASTM D226; No. 15 asphalt saturated roofing felt.
- B. Backing Board: ANSI/TCA A118.9; High density, cementitious, glass fiber reinforced, 1/2 inch thick; 2 inch wide coated glass fiber tape for joints and corners; manufacture licensed by TCA.
- C. Sealant: Type specified in Section 07 92 00.

2.7 MORTAR MIX AND GROUT MIX

- A. Mix and proportion pre-mix setting bed and grout materials in accordance with manufacturer's instructions and referenced standards.

2.8 SEALER

- A. Tile and Grout Sealer: Aqua Mix Penetrating Sealer manufactured by Aqua Mix, Inc., www.aquamix.com.

3. PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are ready to receive work.
- B. Beginning of installation means installer accepts condition of existing surfaces.

3.2 PREPARATION

- A. Protect surrounding work from damage or disfiguration.
- B. Vacuum clean existing surfaces and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.
- D. Blend tiles before installation to produce an even range of color and finish.

3.3 INSTALLATION - THINSET METHOD

- A. Install mortar, tile, and grout in accordance with ANSI/TCA 108.5 and applicable tile installation standards of the TCA Handbook.
- B. Install membrane over substrate; weatherlap horizontal edges 4 inches, vertical edges 6 inches.
- C. Install backing board in accordance with manufacturer's instructions and ANSI/TCA A108.11. Tape joints and corners; cover with skim coat of dry-set mortar to a feather edge.
- D. Lay tile to pattern indicated. If not indicated, request from Architect. Do not interrupt tile pattern around openings.
- E. Cut and fit tile tight to penetrations through tile. Form corners and bases neatly. Align wall, base, and floor joints.

- F. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar or excess grout.
- G. Form internal angles square and external angles square.
- H. Sound tile after setting. Replace hollow sounding units.
- I. Keep control joints free of mortar or grout. Apply sealant to joints.
- J. Allow tile to set for a minimum of 48 hours prior to grouting.
- K. Grout tile joints.
- L. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

3.4 CLEANING

- A. Clean work under provisions of Section 01 77 00.
- B. Clean tile surfaces.

3.5 SEALING

- A. Install sealer on all surfaces in accordance with manufacturer's instructions.

END OF SECTION

SECTION 09 67 26

QUARTZ FLOORING

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fluid applied epoxy flooring and base with epoxy top coat.
- B. Quartz chip aggregate.
- C. Base cap edging.

1.2 REFERENCES

- A. 2010 Americans with Disabilities Act (ADA) Standards for Accessible Design.
- B. CBC - California Building Code, (CCR) California Code of Regulations, Title 24, Part 2, California State Accessibility Standards.
- C. ASTM C307 - Standard Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacing.
- D. ASTM C580 - Standard Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.
- E. ASTM D413 - Standard Test Method for Rubber Property - Adhesion to Flexible Substrate.
- F. ASTM D579 - Standard Specification for Greige Woven Glass Fabrics.
- G. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.
- H. ASTM D648 - Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position.
- I. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
- J. ASTM D1004 - Standard Test Method for Initial Tear Resistance of Plastic Film and Sheeting.
- K. ASTM D2047 - Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine.
- L. ASTM D2240 - Standard Test Method for Rubber Property - Durometer Hardness.
- M. ASTM F710 - Practice for Preparing Concrete Floors and other Monolithic Floors to Receive Resilient Flooring.
- N. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- O. ASTM F2170 - Determining Relative Humidity in Concrete Floor Slabs Using In Situ Probe.
- P. ACI Committee No. 503.1PP - Bond Strength.
- Q. MIL - D - 3134F - Indentation.
- R. UL - Underwriters' Laboratories.

1.3 QUALIFICATIONS

- A. Applicator: Company specializing in epoxy matrix floor applications with five years documented experience.
- B. Supervisor: Trained by product manufacturer.

1.4 REGULATORY REQUIREMENTS

- A. Conform to applicable codes for flooring flame/fuel/smoke ratings in accordance with UL.
- B. Products supplied for flooring installation shall comply with regulations controlling use of volatile organic compounds (VOC).
- C. Flooring shall have a coefficient of friction when tested according to ASTM D2047 of 0.60 for flat floors and 0.80 for ramped surfaces.
- D. Conform to CBC, California Building Code, (CCR) Title 24, Part 2, and the 2010 ADA Standards for Accessible Design for accessibility requirements.

1.5 SUBMITTALS

- A. Submit product data under provisions of Section 01 33 00.
- B. Submit product data for base cap.
- C. Submit samples under provisions of Section 01 33 00.
- D. Submit two samples 4 x 4 inch in size illustrating color, chip size and variation, and matrix color.

1.6 OPERATION AND MAINTENANCE DATA

- A. Submit cleaning and maintenance data under provisions of Section 01 77 00.
- B. Include procedures for stain removal, repairing surface, and cleaning.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and protect products under provisions of Section 01 61 00.
- B. Store materials in a dry, secure area.
- C. Maintain temperature of 55 degrees F.
- D. Keep products away from fire or open flame.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Do not install flooring when temperature is below 60 degrees F or above 90 degrees F.
- B. Maintain this temperature range, 24 hours before, during, and 72 hours after installation of flooring.
- C. Ventilate area where flooring is being installed. Post and enforce NO SMOKING or OPEN FLAME signs until flooring has cured.
- D. Provide uniform lighting of 50 fc in area of installation.
- E. Restrict traffic from area where flooring is being installed or is curing.

- F. Moisture Testing: Perform tests as recommended by flooring materials manufacturer and as follows. Proceed with installation only after substrates pass testing.
1. Subfloor Moisture Conditions: Moisture emission rate of no more than 3 lb/1000 sq. ft./24 hours when tested by the Quantitative Anhydrous Calcium Chloride Test, ASTM F1869, with subfloor temperature not less than 65 degrees F.
 2. Subfloor Humidity Conditions: Relative humidity level of no more than 75 percent when tested by in situ drilled probes according to ASTM F2170.
 3. Subfloor Alkalinity Conditions: pH range of between 5 to 9 when subfloor is wetted with potable water and pHdrion paper is applied.

1.9 WARRANTY

- A. Provide one year warranty under provisions of Section 01 77 00.
- B. Warranty: Include coverage for delamination of floor and base materials from substrate, degradation of surface finish.

2. PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. General Polymers Corporation, TPM No. 115 Upgraded, www.generalpolymers.com.
- B. Crossfield Products Corp., (Dex-O-Tex) Cheminert CFS, K-D, www.dex-o-tex.com.
- C. Dur-A-Flex, Inc., Dura-A-Quartz, www.dur-a-flex.com.
- D. Stonhard Inc., Stoneshield HRI, www.stonhard.com.
- E. Substitutions: Under provisions of Section 01 25 13.

2.2 PERFORMANCE REQUIREMENTS

- A. Conform to the following:

<u>Property</u>	<u>Test</u>	<u>Result</u>
Tensile Strength	ASTM C307	1,650 psi
Compressive Strength (7 days)	ASTM D579	10,000 psi
Flexural Strength	ASTM C580	4,300 psi
Flexural Modulus of Elasticity	ASTM D790	2.0 x 10 ⁶ psi
Hardness	ASTM D2240	85-90 Shore Durometer
Indentation	MIL-D3134F	No Indentation
Coefficient of Friction	ASTM D2047	0.7
Heat Deflection Temperature	ASTM D648	100 degrees F/ 38 degrees C
Water Absorption	ASTM D413	0.10 percent
Fire Resistance	ASTM D635	Self Extinguishing. Extent of Burning, .25 inches maximum
Bond Strength	ACI 503.1	400 psi minimum
Abrasion Resistance	ASTM D1004	Maximum weight loss of 0.10 gm/1000 cycles

2.3 MATERIALS

- A. Primer: A two-component, penetrating, moisture tolerant, epoxy primer.
- B. Base: A three-component, integral troweled mortar base consisting of epoxy resin, curing agent and finely graded silica aggregate.
- C. Undercoat: A two-component, thixotropic epoxy undercoat sealer.
- D. Aggregate: Brightly colored, quartz aggregate broadcast onto the surface.
- E. Sealer: A high performance, two-component, clear UV resistant epoxy sealer.

2.4 ACCESSORIES

- A. Subfloor Filler: White premix Portland Cement latex type as recommended by flooring material manufacturer.
- B. Base Cap: 0.0478 inch thick zinc L shaped strip with perforated flange as manufactured by the Manhattan American Strip Company, www.ntma.com.

2.5 COLORS

- A. Resin and Aggregate: Color as selected by Architect from manufacturer's entire color range.

3. PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin work until concrete substrate has cured 90 days minimum.
- B. Verify that substrate is ready to receive work, and that subfloor surface is clean, dry, and free of substances which could affect bond.
- C. Verify that concrete slabs comply with ASTM F710 and are as specified herein.
- D. Verify concrete floors exhibit acceptable moisture emission rate and humidity level; and exhibit negative alkalinity, carbonization, or dusting.
- E. Verify that surfaces are smooth and flat and are ready to receive Work.
- F. Beginning of installation means acceptance of existing substrate and site conditions.

3.2 PROTECTION

- A. Protect elements surrounding the work of this Section from damage or disfiguration.

3.3 PREPARATION

- A. Prepare concrete substrate according to ASTM F710.
- B. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.
- C. Apply, trowel, and float filler to leave a smooth, flat, hard surface.
- D. Clean substrate surface free of foreign matter and scrub with manufacturer supplied detergent.
- E. Control, expansion joints and cracks in concrete floor substrate shall be routed out and filled with resilient sealant and reinforced with 20 x 20 fiberglass mesh.
- F. Prohibit traffic from area until filler is cured.
- G. Vacuum clean substrate.

3.4 INSTALLATION - ACCESSORIES

- A. Install terminating cap strip at top of base; attach securely to wall substrate.

3.5 INSTALLATION - FLOORING

- A. Apply primer to concrete slab surfaces.
- B. Apply flooring in accordance with manufacturer's instructions.
- C. Apply to a minimum thickness of 1/4 inch.
- D. Finish to smooth level surface sloped to drains.
- E. Provide 3/8 inch cove fillet at vertical surfaces.
- F. Extend up vertical surface to form base.
- G. Apply final sealer in two coats.

3.6 TOLERANCES

- A. Maximum Variation from Flat Surface: 1/8 inch in 10 feet.

3.7 PROTECTION

- A. Protect finished installation under provisions of Section 01 61 00.
- B. Do not permit traffic over finished floor surfaces.

END OF SECTION

SECTION 09 77 33

FIBER REINFORCED PLASTIC PANELS

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fiberglass reinforced plastic (FRP) panels.
- B. Panel moldings.

1.2 REFERENCES

- A. ASTM E84 - Surface Burning Characteristics of Building Materials.

1.3 SUBMITTALS

- A. Submit product data under provisions of Section 01 33 00.
- B. Submit product data for panels and accessories.
- C. Submit samples under provisions of Section 01 33 00.
- D. Submit two samples 4 x 4 inches in size illustrating panel pattern and color. Submit two 12 inch long samples of panel moldings.
- E. Submit manufacturer's installation instructions under provisions of Section 01 33 00.

1.4 OPERATION AND MAINTENANCE DATA

- A. Submit maintenance data under provisions of Section 01 77 00.
- B. Include data for cleaning and stain removal.
- C. Include manufacturer's recommendations for cleaning materials, polishes, and waxes.

1.5 REGULATORY REQUIREMENTS

- A. Conform to flame/smoke developed rating of 25/450 when tested in accordance with ASTM E84.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and protect products to site under provisions of Section 01 61 00.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Do not install fiberglass reinforced plastic panels when temperatures are below 60 degrees F or above 90 degrees F.
- B. Maintain temperature range for 24 hours before, during, and 72 hours after installation of panels.

1.8 WARRANTY

- A. Provide one year warranty under provisions of Section 01 77 00.
- B. Include coverage for surface staining and finish deterioration.

2. PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Crane Composites, Inc., www.cranecomposites.com.
- B. Marlite, www.marlite.com.
- C. Nudo Products, Inc., www.nudo.com.
- D. Substitutions: Under provisions of Section 01 25 13.

2.2 MATERIALS

- A. Fiberglass reinforced plastic panels of 0.090 inch thickness in 4 x 8 foot sheet sizes.
- B. Panels to have smooth flat surface finish in color selected by Architect.
- C. Panels to have a flame/smoke rating of 25/450 for a Class A finish when tested according to ASTM E84.

2.3 ACCESSORIES

- A. Moldings: Extruded aluminum or plastic panel accessories in maximum practical lengths. Finish to match panels.
- B. Adhesive: Latex based non-flammable construction adhesive.
- C. Sealant: Silicone sealant specified in Section 07 92 00.
- D. Substitutions: Under provisions of Section 01 25 13.

3. PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and openings are ready to receive work.
- B. Verify that field measurements and tolerances are as instructed by manufacturer.
- C. Verify that required utilities are available, in proper location, and ready for use.
- D. Beginning of installation constitutes acceptance of existing substrate surface conditions by installer.

3.2 PREPARATION

- A. Clean substrate surfaces.
- B. Protect elements of work adjacent to work of this Section from damage or disfiguration.

3.3 INSTALLATION

- A. Install panels and accessories in accordance with manufacturer's instructions.
- B. Coordinate location of panel joints to minimize interference with fixtures and accessories.
- C. Apply panel adhesive at 6 inches on center over entire field of panel.
- D. Set panel ends and edges in moldings.
- E. Seal moldings and panel joints with sealant.

3.4 FIELD QUALITY CONTROL

- A. Panels shall lay flush with substrate, without air pockets or warpage.
- B. Remove and replace panels not conforming to manufacturer's installation guidelines.

3.5 CLEANING

- A. Clean work under provisions of Section 01 77 00.

3.6 PROTECTION

- A. Protect finished installation under provisions of Section 01 61 00.

END OF SECTION

SECTION 09 90 00

PAINING

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Surface preparation.
- B. Products and application.
- C. Surface finish schedule.

1.2 SUMMARY OF PAINTED SUBSTRATES

- A. Section includes the application of paint systems on the following interior substrates:
 - 1. Concrete.
 - 2. Primed or unprimed steel.
 - 3. Steel doors, frames and lights.
 - 4. Wood doors.
 - 5. Access doors and frames.
 - 6. Overhead coiling doors and frames.
 - 7. Wood.
 - 8. Horizontal and vertical gypsum board.
 - 9. Wall louvers.
 - 10. Electrical panel board covers.
- B. Section includes the application of paint systems on the following exterior substrates:
 - 1. Concrete.
 - 2. Primed or unprimed steel.
 - 3. Steel doors, frames and lights.
 - 4. Access doors and frames.
 - 5. Overhead coiling doors and frames.
 - 6. Wood.
 - 7. Wall louvers.
 - 8. Exterior Synthetic Trim.
- C. Substrate listings are for principal surfaces only. Refer to drawings, details and individual specification sections for items, surfaces, and substrates not specifically listed.

1.3 REFERENCES

- A. ASTM D16 - Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.
- B. SSPC - The Society for Protective Coatings.

1.4 SYSTEM DESCRIPTION

- A. Preparation of all surfaces to receive final finish.
- B. Painting and finishing work of this section using coating systems of materials including primers, sealers, fillers, and other applied materials whether used as prime, intermediate, or finish coats.
- C. Surface preparation, priming, and finish coats specified in this Section are in addition to shop-priming and surface treatment specified under other Sections.
- D. Painting and finishing all exterior and interior surfaces of materials including structural, mechanical, and electrical work on site, in building spaces, and above or on the roof.
- E. Paint exposed surfaces except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces.

1.5 DEFINITIONS

- A. Conform to ASTM D16 for interpretation of terms used in this Section.

1.6 QUALITY ASSURANCE

- A. Product Manufacturer: Company specializing in manufacturing quality paint and finish products with five years experience.
- B. Applicator: Company specializing in commercial painting and finishing with five years documented experience.
- C. Coats: The number of coats specified is the minimum number acceptable. If full coverage is not obtained with the specified number of coats, apply such additional coats as are necessary to produce the required finish.
- D. Employ coats and undercoats for all types of finishes in strict accordance with the recommendations of the paint manufacturer.
- E. Provide primers and undercoat paint produced by the same manufacturer as the finish coat.
- F. The minimum dry film thickness of each coat of paint shall comply with the manufacturer's recommendations for each type of paint used.

1.7 REGULATORY REQUIREMENTS

- A. 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.
- B. Comply with the current applicable regulations of the California Air Resources Board (CARB) and the Environmental Protection Agency (EPA).

1.8 SUBMITTALS

- A. Submit product data under provisions of Section 01 33 00.
- B. Product data for each coating type shall include as a minimum the following items. Listing shall be by manufacturer's catalog number:
 - 1. Solvent type.
 - 2. Resin type and percentage.
 - 3. Prime pigments by percent of weight.
 - 4. Reinforcing pigment by percent of weight

5. Solids and volume by weight.
 6. VOC and RAVOC limits.
 7. Coverage rates and film thickness both wet and dry.
 8. Conformance to environmental standards listed.
 9. Surface preparation recommendations.
 10. Application, storage, clean up and disposal recommendations.
 11. Special instructions from the manufacturer for proper preparation and application.
- C. Provide manufacturer's technical information and instructions for application of each material proposed for use by catalog number.
 - D. List each material by catalog number and cross-reference specific coating with specified finish system.
 - E. Technical data sheets and all container labels must match and shall contain the same product identification numbers. The term "Series " is not acceptable.
 - F. Provide manufacturer's written and signed certificate that products proposed meet or exceed specified materials.
 - G. Submit samples under provisions of Section 01 33 00.
 - H. Submit two samples 8-1/2 x 11 inch in size of each paint color and texture applied to cardboard. Resubmit samples until acceptable color, sheen and texture is obtained.
 - I. On same species and quality of wood to be installed, submit two 4 x 8 inch samples showing system to be used for varnishes and stains.

1.9 FIELD SAMPLES

- A. Provide field samples under provisions of Section 01 33 00.
- B. On wall surfaces and other exterior and interior components, duplicate specified finishes on at least 100 sq.ft. of surface area.
- C. Provide full-coat finishes until required coverage, sheen, color and texture are obtained.
- D. Simulate finished lighting conditions for review of field samples.
- E. After finishes are accepted, the accepted surface may remain as part of the work and will be used to evaluate subsequent coating systems applications of a similar nature.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site and store and protect under provisions of Section 01 61 00.
- B. Deliver products to site in sealed and labeled containers; inspect to verify acceptance.
- C. Container labeling to include manufacturer's name, type of paint, brand name, brand code, coverage, surface preparation, drying time, cleanup, color designation, and instructions for mixing and reducing. Paint containers not displaying product identification will not be acceptable.
- D. Store paint materials at minimum ambient temperature of 50 degrees F and a maximum of 90 degrees F, in well ventilated area, unless required otherwise by manufacturer's instructions.
- E. Take precautionary measures to prevent fire hazards and spontaneous combustion.

1.11 ENVIRONMENTAL REQUIREMENTS

- A. Provide continuous ventilation and heating facilities to maintain interior surface and ambient temperatures above 50 degrees F with a maximum humidity level of 50 percent for 24 hours before, during, and 48 hours after application of finishes, unless required otherwise by manufacturer's instructions.
- B. Do not apply exterior coatings during rain or snow, or when relative humidity is above 50 percent, unless required otherwise by manufacturer's instructions.
- C. Minimum Application Temperatures for Latex Paints: 50 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
- D. Minimum Application Temperature for Varnish and Urethane Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.
- E. Provide lighting level of 80 foot candles measured mid-height at substrate surface.

1.12 EXTRA MATERIAL

- A. Provide a one gallon unopened container of each color to Owner.
- B. Label each container with color, texture, and room locations in addition to the manufacturer's label.

2. PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS - PAINT

- A. Unless specifically identified otherwise, product designations included in this section are those that are manufactured and distributed by the Dunn-Edwards Corporation, www.dunnedwards.com and shall serve as the basis of design standard for kind, quality, performance and function.
- B. Subject to full compliance with specified requirements, other manufacturers offering equivalent products are:
 - 1. Benjamin Moore Paints, www.benjaminmoore.com.
 - 2. Kelly-Moore Paint Company, www.kellymoore.com.
 - 3. Sherwin Williams, www.sherwin-williams.com.
- C. Substitutions: Under provisions of Section 01 25 13.

2.2 MATERIALS

- A. Ready mixed, except field catalyzed coatings. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating.
- B. Good flow and brushing properties; capable of drying or curing free of streaks or sags.
- C. "Deep Tone" colors to be composed of 100 percent acrylic pigments with a colored base.
- D. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.

2.3 FINISHES

- A. Refer to schedule at end of Section for surface finish schedule.

3. PART 3 EXECUTION

3.1 INSPECTION

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - 1. Plaster and Gypsum Wallboard : 12 percent.
 - 2. Masonry, Concrete, and Concrete Unit Masonry : 12 percent.
 - 3. Interior Located Wood : 15 percent.
 - 4. Exterior Located Wood : 15 percent.
- D. Beginning of installation means acceptance of existing surfaces.

3.2 SURFACE PREPARATION - GENERAL

- A. Remove electrical plates, hardware, light fixture trim, and fittings prior to preparing surfaces or finishing.
- B. Remove all finish hardware from doors and frames prior to preparing surfaces or finishing.
- C. Correct minor defects and clean surfaces which affect work of this Section.
- D. Shellac and seal marks which may bleed through surface finishes.
- E. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- F. Aluminum Surfaces: Remove surface contamination by steam or high pressure water. Remove oxidation with acid etch and solvent washing. Apply etching primer immediately following cleaning.
- G. Insulated Coverings: Remove dirt, grease, and oil from canvas and cotton.
- H. Concrete Floors: Remove contamination, acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.
- I. Gypsum Board: Repair all voids, nicks, cracks and dents with patching materials and finish flush with adjacent surface. Latex fill minor defects. Spot prime defects after repair.
- J. Galvanized Surfaces: Remove surface contamination and oils and wash with solvent. Pretreat with phosphoric acid etch or vinyl wash. Apply coat of etching primer the same day as pretreatment is applied.
- K. Concrete and Unit Masonry: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
- L. Uncoated Steel and Iron: Remove grease, scale, dirt, and rust. Where heavy coatings of scale are evident, remove by wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint after repairs.
- M. Shop Primed Steel: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime paint steel surfaces.
- N. Interior Wood: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats.

- O. Wood Doors: Seal top and bottom edges with 2 coats of spar varnish sealer.
- P. Existing surfaces to be recoated shall be thoroughly cleaned and deglossed by sanding or other means prior to painting. Patched and bare areas shall be spot primed with same primer as specified for new work.

3.3 SURFACE PREPARATION - MODERNIZATION

- A. Properly prepare all existing surfaces to receive new paint.
- B. Prior to application of any new paint, existing surfaces to be cleaned free of damaged paint, dust, corrosion, and other foreign matter which will destroy bond or mar appearance of new paint.
- C. Sand, scrape, fill and repair surfaces flush with suitable fillers. Patch and repair; feather edges to provide smooth transitions; match existing surfaces.
- D. 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 upon completion of work in each area.
- E. Existing surfaces to be painted shall be thoroughly cleaned and deglossed by sanding or other means prior to painting. Patched and bare areas shall be shall be spot primed with same primer as for new work.
- F. Existing paint removal:
 - 1. Remove loose, blistered, scaled, oxidized, cracked, alligatored, or defaced paint down to a sound surface.
 - 2. Brush and clean free all loose material.
 - 3. Feather edges of removal areas to provide a smooth transition between surfaces.
- G. Perform preparation and cleaning procedures in strict accordance with coating manufacturer's instructions for each substrate condition.
- H. Washing and Cleaning:
 - 1. Remove all loose and foreign materials.
 - 2. At building interiors, wash all surfaces clean with approved cleaner and rinse with clean water.
 - 3. At building interiors, vacuum existing ceiling panels to remove all dirt and dust from the material surface. Utilize caution so as not to mar or damage the finish surface in any way.
 - 4. Completely remove wax from surfaces which receive new paint.
- I. Remove dust, grit, and foreign matter from existing wood surfaces. Sand surfaces and dust clean. Spot coat knots, pitch streaks, and sappy section with pigmented stain sealer when surfaces are to be painted. Fill nail holes, cracks, and other defects after priming and spot prime repairs when fully cured.
- J. Repair and crack filling:
 - 1. Wood: Putty cracks and holes flush at stained and or varnished work, color putty to match. Sand smooth any rough spots. Seal knots and pitch pockets.
 - 2. Gypsum Wallboard: Fill all nail heads, screw heads, holes, cracks, or defects with drywall joint compound or spackle. Sand any rough spots smooth; do not raise nap on paper covering. Remove dust. Skim coat drywall must be sealed with a suitable sealer recommended by the coating manufacturer.
- K. Ferrous metal shall be cleaned of oil, grease, and foreign matter. Cleaning method: SSPC-SP No. 1 "Solvent Cleaning".

- L. Ferrous Steel: Where raw metal surface is exposed, proceeds follows:
 - 1. Cleaning method: SSPC-SP No. 2 "Hand Cleaning" or No. 3 "Power Brush Cleaning" as required to remove corrosion, loose paint, and rust.
 - 2. Priming: Prime immediately after cleaning.
- M. Galvanized Metal: Where galvanizing is exposed, proceed as follows:
 - 1. Cleaning: Solvent clean per SSPC-SP No. 1 "Solvent Cleaning".
 - 2. Pre-Treatment; Apply Supreme Chemical Metal Clean and Etch SC-ME01, follow manufacturer's recommendations and the following:
 - (a) Application: Brush apply in a thin even coat. Remove excessive solution from surface with rags, squeegee, or sponge. When using full strength, rinse surface with water.
 - (b) Thinning: Use water, do not reduce solution beyond 3 parts water to 1 part Supreme Chemical Metal Clean and Etch SC-ME01.
 - (c) Drying: Allow to dry for 10 minutes, rinse thoroughly with water and wipe dry with rags.
 - 3. Cleaned and treated galvanized metal should be primed within 48 hours.
- N. Thoroughly back paint all surfaces of exterior and interior finish lumber and millwork, including doors and window frames, trim, cabinetwork, etc., which will be concealed after installation. Back paint items to be painted with a priming coat. Use a clear sealer for back priming where transparent finish is required.
- O. Pipes, ducts, hangers, exposed steel and ironwork, and primed metal surfaces of equipment installed under mechanical and electrical work shall be cleaned prior to priming.

3.4 PROTECTION OF ADJACENT WORK

- A. Protect elements surrounding the work of this Section from damage or disfiguration.
- B. Repair damage to other surfaces caused by work of this Section.
- C. Furnish drop cloths, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.
- D. Remove empty paint containers from site.

3.5 WORK NOT TO BE PAINTED

- A. Painting is not required on surfaces in concealed and inaccessible areas such as furred spaces, foundation spaces, utility tunnels, pipe spaces and duct shafts.
- B. Do not paint metal surfaces such as stainless steel, chromium plate, brass, bronze, and similar finished metal surfaces.
- C. Do not paint anodized aluminum or other surfaces which are specified to be factory pre-finished.
- D. Do not paint over Underwriters Laboratories, Factory Mutual or other code-required labels or identifications.

3.6 APPLICATION

- A. Apply products in accordance with manufacturer's instructions.
- B. Do not apply finishes to surfaces that are not dry.
- C. Apply prime coat to surfaces which are to be painted or finished.
- D. Apply each coat to uniform finish.
- E. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.

- F. Sand lightly between coats to achieve required finish.
- G. Allow applied coat to dry before next coat is applied.
- H. 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.
- I. Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
- J. Prime back surfaces of interior and exterior woodwork with primer paint.
- K. Prime back surfaces of interior woodwork scheduled to receive stain or varnish finish with gloss varnish reduced 25 percent with mineral spirits.
- L. Paint mill finished door seals to match door or frame.
- M. Paint primed steel glazing stops in doors to match door or frame.
- N. Cloudiness, spotting, lap marks, brush marks, runs, sags, spikes and other surface imperfections will not be acceptable.
- O. Where spray application is used, apply each coat of the required thickness. Do not double back to build up film thickness of two coats in one pass.
- P. Where roller application is used, roll and redistribute paint to an even and fine texture. Leave no evidence of roller laps, irregularity of texture, skid marks, or other surface imperfections.

3.7 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Paint shop primed equipment. Do not paint shop prefinished items.
- B. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- C. Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, except where items are prefinished.
- D. Replace identification markings on mechanical or electrical equipment when painted accidentally.
- E. Paint interior surfaces of air ducts, and connector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint, to limit of sight line. Paint dampers exposed behind louvers, grilles, and connector and baseboard cabinets to match face panels.
- F. Paint exposed conduit and electrical equipment occurring in finished areas.
- G. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.
- H. Replace electrical plates, hardware, light fixture trim, and fittings removed prior to finishing.
- I. Paint grilles, registers, and diffusers which do not match color of adjacent surface.
- J. Paint all mechanical and electrical equipment, vents, fans, and the like occurring on roof.
- K. Do not paint moving parts of operating units; mechanical or electrical parts such as valve operators; linkages; sensing devices; and motor shafts.
- L. Do not paint over labels or equipment identification markings.
- M. Do not paint mechanical room specialties such as compressors, boilers, pumps, control panels, etc.
- N. Do not paint switch plates, light fixtures, and fixture lenses.

3.8 CLEANING

- A. As Work proceeds, promptly remove paint where spilled, splashed, or spattered.
- B. During progress of Work maintain premises free of unnecessary accumulation of tools, equipment, surplus materials, and debris.
- C. Collect cotton waste, cloths, and material which may constitute a fire hazard, place in closed metal containers and remove daily from site.

3.9 PROTECTION OF COMPLETED WORK

- A. Protect finished installation under provisions of Section 01 61 00.
- B. Erect barriers and post warning signs. Maintain in place until coatings are fully dry.
- C. Confirm that no dust generating activities will occur following application of coatings.

3.10 PATCHING

- A. After completion of painting in any one room or area, repair surfaces damaged by other trades.
- B. Touch-up or re-finish as required to produce intended appearance.

3.11 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 01 45 29.
- B. The Owner reserves the right to invoke the following test procedure at any time and as often as the Owner deems necessary.
- C. The Owner will engage the services of an independent testing agency to sample paint material being used.
- D. Samples of material delivered to the Project will be taken, identified, sealed, and certified in the presence of the Contractor.
- E. The testing agency will perform appropriate quantitative materials analysis and other characteristic testing of materials as required by the Owner.
- F. If test results show materials being used and their installation do not comply with specified requirements or manufacturer's recommendations, the Contractor may be directed to stop painting, remove noncomplying paint, pay for testing and repaint surfaces to acceptable condition.

3.12 COLOR SCHEDULE

- A. Paint and finish colors shall be selected by the Architect from manufacturer's entire range of standard and custom color selections and special colors selected to match or compliment the colors of other materials, equipment, or components which comprise the work.
- B. Access doors, registers, exposed piping, electrical conduit and mechanical/electrical panels: Generally the same color as adjacent walls.
- C. Exterior and interior steel doors, frames and trim: Generally a contrasting color to adjacent walls.
- D. Doors generally are all the same color, but of a contrasting color from frame and trim.
- E. Exterior and interior steel fabrications: Generally a contrasting color to adjacent walls.
- F. Exposed interior mechanical/ductwork: Generally a contrasting color to adjacent walls or ceiling.
- G. Ceilings are generally to be painted a different color than walls.
- H. Three different color schemes for painting of walls.
- I. Approximately 20 percent of overall painting work will be required to be "Deep Tone" colors. This work will require one additional coat of paint beyond that as specified.

3.13 SCHEDULE - EXTERIOR SURFACES

A. Wood-Painted (Flat Acrylic)

1st coat:	ESZPROO EZ Prime Premium
2nd coat:	EVSH10 Evershield
3rd coat:	EVSH10 Evershield

B. Steel - Primed or Unprimed (Semi-Gloss Urethane Alkyd Enamel)

1st coat:	BRPR00 Bloc-Rust Premium
2nd coat:	ASHL50 Aristoshield
3rd coat:	ASHL50 Aristoshield

3.14 SCHEDULE - INTERIOR SURFACES

A. Wood - Transparent (Stain - Semi-Gloss Polyurethane)

1st coat:	V109 Stainseal - Minwax Stain
Filler coat (Open grain wood only):	Valspar Wood Filler VSP 0109
2nd coat:	Cabot W.B. Polyurethane CAB 8087-1
3rd coat:	Cabot W.B. Polyurethane CAB 8087-1
4th coat:	Cabot W.B. Polyurethane CAB 8087-1

B. Concrete Floors - Sealed (Low Sheen Epoxy Acrylic)

1st coat:	Seal Krete - Clean - N - Etch
2nd coat:	Seal Krete - Lock Down Primer
3rd coat:	Seal Krete - Epoxy Seal with Decorative Flakes
4th coat:	Seal Krete - Clear Sealer

C. Steel - Primed or Unprimed (Semi-Gloss Urethane Alkyd Enamel)

1st coat:	BRPR00 Bloc-Rust Premium
2nd coat:	ASHL50 Aristoshield
3rd coat:	ASHL50 Aristoshield

D. Gypsum Board (Semi-Gloss Acrylic)

1st coat:	VNPROO Vinylastic Premium
2nd coat:	SPMA50 Suprema
3rd coat:	SPMA50 Suprema

END OF SECTION

SECTION 10 14 00

SIGNAGE

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Plastic/acrylic signs.
- B. Metal signs.

1.2 REFERENCES

- A. CBC - California Building Code, (CCR) California Code of Regulations, Title 24, Part 2.
- B. 2010 Americans with Disabilities Act (ADA) Standards for Accessible Design.

1.3 SUBMITTALS

- A. Submit shop drawings under provisions of Section 01 33 00.
- B. Submit shop drawings listing sign styles, lettering and locations, spacing and installation method.
- C. Submit samples under provisions of Section 01 33 00.
- D. Submit two samples illustrating full size sample sign, of type, style and color specified including method of attachment.
- E. Submit manufacturer's installation instructions under provisions of Section 01 33 00.
- F. Include installation templates and hardware.

1.4 REGULATORY REQUIREMENTS

- A. Conform to CBC - California Building Code, (CCR), Title 24, Part 2 and the 2010 Americans with Disabilities Act (ADA) Standards for Accessible Design for accessibility requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and protect products to site under provisions of Section 01 61 00.
- B. Package signs, labeled in name groups.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not install adhesive mounted signs when ambient temperature is below 70 degrees F. Maintain this minimum during and after installation of signs.

2. PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acrylic Signs:
 - 1. Architectural Sign Identity, www.architecturalsignidentity.com.
 - 2. ASI - Sign Systems, www.asisignage.com.
 - 3. Mohawk Sign Systems, www.mohawksign.com.
 - 4. Substitutions: Under provisions of Section 01 25 13.

B. Metal and Traffic Signs:

1. Four S Company, (877) 597-1288. No URL available.
2. Signs and Lucite Products, Inc., www.adasignscalifornia.com
3. Signtec, www.signtec.com.
4. Traffic Management Inc., www.trafficmanagement.com.
5. Substitutions: Under provisions of Section 01 25 13.

2.2 MANUFACTURED UNITS

- A. Room Control Signage: Mohawk Sign Systems, Series 200A, Format A Sand Carved Process, with 1/32 inch raised border and letters with integral California round top contracted Grade 2 braille dots with dot spacing in compliance with CBC Table 11B-703.3.1 raised a minimum of 1/40 inch. Material shall be 1/8 inch thick x 6 inch high MP plastic plate of length required with 1 inch high Helvetica medium lettering; adhesive and mechanical mounting with copy centered on plate. Provide one sign for each door shown on the drawings. Allow for twelve letters and three numerals for each sign. Signage to be in compliance with the requirements of Article 703 of the 2010 ADA Standards for Accessible Design and CBC, California Building Code (CCR), Title 24, Part 2, Section 11B-703.
- B. Tactile Exit Signage: Mohawk Sign Systems, Series 200A, Format A Sand Carved Process, with 1/32 inch raised border and letters with integral California round top contracted Grade 2 braille dots with dot spacing in compliance with CBC Table 11B-703.3.1 raised a minimum of 1/40 inch. Material shall be 1/8 inch thick x 6 inch high MP plastic plate of length required with 1 inch high Helvetica medium lettering; adhesive and mechanical mounting with copy centered on plate. Provide signs at locations shown on the drawings. Signage to be in compliance with the requirements of Article 703 of the 2010 ADA Standards for Accessible Design and CBC, California Building Code (CCR), Title 24, Part 2, Section 1011.4 and 11B-703.
- C. Pictorial Symbol Signage: Mohawk Sign Systems, Series 200A, Format A Sand Carved Process, with 1/32 inch raised border and letters with integral California round top contracted Grade 2 braille dots with dot spacing in compliance with CBC Table 11B-703.3.1 raised a minimum of 1/40 inch. Material shall be 1/8 inch thick MP plastic plate of size indicated with lettering and symbols as indicated; adhesive and mechanical mounting with copy centered on plate. Provide sign in locations shown on the drawings. Signage to be in compliance with the requirements of Article 703 of the 2010 ADA Standards for Accessible Design and CBC, California Building Code (CCR), Title 24, Part 2, Section 11B-703.
- D. Entrance and Restroom Signage:
1. Restroom Doors: Acrylic plastic signs equivalent to that as detailed on the drawings; 12 inch circle and triangle with international symbol of accessibility in accordance with CBC, California Building Code, (CCR), Title 24, Part 2, Section 11B-216.8 and 11B-703.7.2.6.
 2. Building Entrance: Equivalent to 5 inch square, reflective plastic accessible sign in accordance with CBC, California Building Code (CCR), Title 24, Part 2, Section 11B-216.6 and 11B-703.7.2.1.
- E. Exterior Directional Signage: 0.080 inch thick aluminum sheet sign of size indicated. Paint with reflectorized paint. Graphics and text to be as indicated. Mount sign to wall with four countersunk vandal resistant screws or on free standing 2-inch diameter standard weight galvanized steel pipe post as indicated. Signs shall be in conformance with CBC, California Building Code (CCR), Title 24, Part 2, Section 11B-216.9.2 and 11B-703.5.
- F. Accessible Gate Signage: 0.080 inch thick aluminum sheet sign of size indicated. Paint with reflectorized paint. Graphics and text to be as indicated. Attach sign to adjacent fence with 12 gage wire ties at each corner. Mount sign at 5'-0" from grade to center of sign. Sign shall be in conformance with CBC, California Building Code (CCR), Title 24, Part 2, Section 11B-206.4.7 and 11B-404.1.1.

G. Occupant Load Signage:

1. Provide maximum occupant load signs where indicated on drawings. Locate near main exit of space.
2. Material: 1/8 inch thick x 6 inch high MP plastic plate of length required with 3/4 and 1/2 inch high Helvetica medium lettering: adhesive and mechanical mounting with copy centered on plate.
3. Signage to conform to the requirements of the CBC, California Building Code, (CCR) California Code of Regulations, Title 24, Part 2, Section 1004.3.

H. No Smoking Signage:

1. Material: 1/8 inch thick x 14 inch high x 10 inch plastic plate.
2. Color: Black/Red on White
3. Mounting Type: Mounting Holes
4. Pictogram Description: No Smoking Symbol
5. Text Legend: NO SMOKING IN THIS AREA.

I. Accessories: Provide all anchors, adhesives, and accessories for a complete installation.

3. PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are ready to receive work.
- B. Beginning of installation means installer accepts existing surfaces.

3.2 INSTALLATION - GENERAL

- A. Install in accordance with manufacturer's instructions.
- B. Install true, plumb, level and adequately secured to substrate.
- C. Clean and polish

END OF SECTION

SECTION 10 21 20

SOLID COLOR REINFORCED COMPOSITE TOILET COMPARTMENT

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Solid color reinforced composite toilet partitions and sight screens, floor mounted, headrail braced.
- B. Wall mounted with floor to ceiling pilaster brace.
- C. Hardware.
- D. Attachments screws and bolts.

1.2 REFERENCES

- A. 2010 Americans with Disabilities Act (ADA) Standards for Accessible Design.
- B. CBC - California Building Code, (CCR) - California Code of Regulations, Title 24, Part 2, California State Accessibility Standards.
- C. ASTM A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- D. ASTM E84 - Test Method of Surface Burning Characteristics of Building Materials.
- E. D2197 - Standard Test Method for Adhesion of Organic Coatings by Scrape Adhesion.
- F. D2794 - Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
- G. D6578 - Standard Practice for Determination of Graffiti Resistance.

1.3 PERFORMANCE REQUIREMENTS

- A. Graffiti Resistance: Five staining agents cleaned off in accordance with ASTM D6578.
- B. Scratch Resistance: Maximum load value shall exceed 10 kilograms in accordance with ASTM D2197.
- C. Impact Resistance: Maximum impact force value shall exceed 30 inch-lbs in accordance with ASTM D2794.

1.4 SUBMITTALS

- A. Submit product data under provisions of Section 01 33 00.
- B. Submit product data for components, hardware, and accessories.
- C. Submit samples under provisions of Section 01 33 00.
- D. Submit three samples 4 x 4 inch in size cut from actual panel construction, illustrating panel pattern.
- E. Provide a sample of each type of hardware.
- F. Submit manufacturer's installation instructions under provisions of Section 01 33 00.

1.5 REGULATORY REQUIREMENTS

- A. Conform to CBC - California Building Code, (CCR) California Code of Regulations, Title 24, Part 2, and the 2010 ADA Standards for Accessible Design for accessibility requirements.
- B. Conform to Class B flame spread rating of 26-75 and smoke developed ratings of 0/450 for panel materials when tested in accordance with ASTM E84.

1.6 COORDINATION

- A. Coordinate work under provisions of Section 01 31 00.
- B. Coordinate work with support framing, anchors, and blocking.
- C. Coordinate work with placement of plumbing fixtures and floor drains.
- D. Coordinate work with placement of electrical fixtures and equipment.
- E. Coordinate work with toilet accessories.

1.7 WARRANTY

- A. Provide 10-year warranty under provisions of Section 01 77 00.
- B. Warranty to provide for replacement of solid color reinforced composite panels, doors and stiles for breakage, corrosion and delamination.
- C. Furnish one-year warranty for defects in material and workmanship for stainless steel door hardware and mounting brackets.

2. PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Bobrick Washroom Equipment, Inc., Sierra Series with Institutional hardware, www.bobrick.com.
- B. Substitutions: No known substitute.

2.2 MATERIALS

- A. Material composed of dyes, organic fibrous material, and polycarbonate/phenolic resins with a non-ghosting, graffiti resistant surface integrally bonded to core.
- B. Stainless Steel: ASTM A167, Type 304.

2.3 ACCESSORIES

- A. Pilaster Shoe: ASTM A167, Type 304 stainless steel, with adjustable screw jack.
- B. Headrail and Bracing: 1 x 1-5/8 inch anodized extruded aluminum; with anti-grip configuration; with stainless steel wall brackets.
- C. Attachments, Screws, Bolts, and Nuts: Pin-in-head Torx stainless steel fasteners set in threaded brass inserts, factory installed for door hinge and latch connections, capable of withstanding a direct pull force exceeding 1,500 pounds per fastener.
- D. Through Bolts and Nuts: Pin-in-head Torx stainless steel sex bolt fasteners factory installed for latch keeper to stile connections capable of withstanding direct pull force exceeding 1,500 pounds per fastener.

2.4 HARDWARE

- A. Hinges: Full height continuous hinges of 0.0625 inch thick stainless steel. Spring-loaded and self-closing.
- B. Latch and Keeper, Standard Doors: 0.0781 inch thick stainless steel combination slide latch and bumper.
- C. Latch and Keeper, Accessible Stall Door: 14-gage stainless steel combination slide and bumper door latch requiring less than five pound force to operate. Twisting latch operation not acceptable.
- D. Door Stop: Vinyl coated 0.125 inch thick stainless steel door stop with rubber bumpers.
- E. Coat Hook: 0.1094 inch thick stainless steel coat hook.

- F. Door Pull: Stainless steel "U" shaped door pull.
- G. Panel Brackets: Full length "U" shaped brackets of 0.050 inch thick stainless steel.
- H. Leveling Device: 3/16 inch thick hot rolled steel bar; chromate-treated and zinc-plated.

2.5 FABRICATION

- A. Doors and Panels:
 - 1. Door Thickness: 3/4 inch.
 - 2. Panel Thickness: 1/2 inch.
 - 3. Door Width: 24 inch.
 - 4. Door Width for Accessible Use: 36 inch.
 - 5. Panel Height: 58 inch.
 - 6. Panel Height from Floor: 12 inch.
 - 7. Provide for gap-free partition / door interlocking.
- B. Pilasters: 3/4 inch thick, constructed same as doors, of sizes required to suit cubicle width and spacing.
- C. Furnish units with cutouts and drilled holes to receive partition mounted hardware, accessories, and grab bars as indicated.

2.6 FINISHES

- A. Solid Color Reinforced Composite: Color to be selected by Architect from standard colors. Edges to match color of panel.
- B. Stainless Steel Surfaces: No. 4 finish.
- C. Aluminum: Clear anodized.

3. PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that openings are ready to receive work.
- B. Verify field measurements are as shown on shop drawings.
- C. Verify correct location of built-in framing, anchorage, bracing, blocking, electrical, and plumbing fixtures.
- D. Beginning of installation means installer accepts existing conditions.

3.2 ERECTION

- A. Erect in accordance with manufacturer's instructions.
- B. Install partition components secure, plumb and level.
- C. Attach panel brackets securely to walls and floors using appropriate anchor devices.
- D. Attach panels and pilasters to brackets with through bolts and nuts. Locate headrail joints at pilaster center line.
- E. Set all floor anchors and pilaster shoes firmly in mastic.

- F. Provide additional headrail cross bracing at end compartments and accessible stalls to form rigid assembly.
- G. Provide 1/2 inch space between wall surface and panels or pilasters.
- H. Provide for adjustment of floor variations with screw jack through steel saddles integral with pilaster. Conceal floor fastenings with pilaster shoes.
- I. Equip each toilet stall door with hinge, door latch and pull.
- J. Factory install threaded brass inserts for hinge attachments.
- K. Equip each accessible toilet stall door with two pulls, one each side of door. Mount at 3'-4" from floor line to center of pull.
- L. Thru bolt door strike keeper on each pilaster in alignment with door latch.
- M. Equip each accessible toilet stall door with coat hook and bumper. Mount at 4'-0" from floor line to top of hook. Center coat hook and bumper on interior face of door.
- N. Equip each standard toilet stall door with one coat hook and bumper. Mount on interior of door at 6 inches from top of the door to top of hook and 6 inches to hook centerline from strike side of door.

3.3 ERECTION TOLERANCES

- A. Maximum Variation from Plumb or Level: 1/8 inch.
- B. Maximum Misplacement from Intended Position: 1/8 inch.

3.4 ADJUSTING

- A. Adjust work under provisions of Section 01 77 00.
- B. Adjust and align door hardware to uniform clearance at vertical edges of doors. Clearance space not to exceed 3/16 inch.
- C. Adjust door hinges so that free movement is attained and will locate in-swinging doors in partial open position when unlatched and will return out-swinging doors to closed position.

3.5 CLEANING

- A. Clean work under provisions of Section 01 77 00.
- B. Remove protective coverings.
- C. Clean surfaces and hardware.

3.6 PROTECTION OF FINISHED WORK

- A. Protect finished installation under provisions of Section 01 61 00.
- B. Field touch-up of finished surfaces will not be permitted.
- C. Replace damaged or scratched materials with new materials.

END OF SECTION

SECTION 10 28 13

TOILET ACCESSORIES

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Toilet and shower, washroom accessories.
- B. Framed mirror units.
- C. Concealed anchor devices and backing plate reinforcements furnished to other Sections.
- D. Attachment hardware.

1.2 REFERENCES

- A. 2010 Americans with Disabilities Act (ADA) Standards for Accessible Design.
- B. CBC - California Building Code, (CCR) California Code of Regulations, Title 24, Part 2, California State Accessibility Standards.
- C. ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars and Strips.
- D. ASTM A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.
- E. ASTM A366 - Steel, Carbon, Cold-Rolled Sheet, Commercial Quality.
- F. ASTM A386 - Zinc Coating (Hot-Dip) on Assembled Steel Products.
- G. ASTM B456 - Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
- H. ASTM A269 - Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

1.3 SUBMITTALS

- A. Submit product data under provisions of Section 01 33 00.
- B. Provide product data on accessories describing size, finish, details of function, attachment methods.
- C. Submit manufacturer's installation instructions under provisions of Section 01 33 00.

1.4 KEYING

- A. Supply two keys for each accessory to Owner.
- B. Master key all accessories.

1.5 REGULATORY REQUIREMENTS

- A. Conform to CBC, California Building Code, (CCR) Title 24, Part 2, the 2010 Americans with Disabilities Act (ADA) Standards for Accessible Design and for accessibility requirements.
- B. Structural strength of grab bars, shower seats, fasteners and mounting devices shall conform to requirements of the CBC, California Building Code, (CCR) Title 24, Part 2, Section 11B-609, 11B-610 and shall withstand the application of a 250 lb. point load.

1.6 COORDINATION

- A. Coordinate the work of this Section under provisions of Section 01 31 00.
- B. Coordinate the work of this Section with the placement of internal wall reinforcement and reinforcement of toilet partitions to receive anchor attachments.

2. PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design:
 - 1. Bobrick Washroom Equipment, Inc., www.bobrick.com.
 - 2. Substitutions: Under provisions of Section 01 25 13.

2.2 MATERIALS

- A. Sheet Steel: ASTM A366.
- B. Stainless Steel Sheet: ASTM A167, Type 304.
- C. Tubing: ASTM A269, stainless steel, Type 304.

2.3 ACCESSORIES

- A. Adhesive: Two component epoxy type waterproof.
- B. Fasteners, Screws, and Bolts: Hot dip galvanized, tamperproof.
- C. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate

2.4 FABRICATION

- A. Weld and grind smooth joints of fabricated components.
- B. Form exposed surfaces from single sheet of stock, free of joints.
- C. Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.
- D. Back paint components where contact is made with building finishes to prevent electrolysis.
- E. Shop assemble components and package complete with anchors and fittings.
- F. Provide steel anchor plates, adapters, and anchor components for installation.
- G. Hot dip galvanize exposed and painted ferrous metal and fastening devices.
- H. Toilet tissue dispensers located in accessible toilet rooms or stalls shall not have their flow restricted and shall be capable of continuous flow.

2.5 FACTORY FINISHING

- A. Galvanizing: ASTM A123 to 1.25 oz/sq yd.
- B. Shop Primed Ferrous Metals: Pretreat and clean, spray apply one coat primer and bake.
- C. Enamel: Pretreat to clean condition, apply one coat primer and minimum two coats electrostatic baked enamel.
- D. Chrome/Nickel Plating: ASTM B456, Type SC 2 satin finish.
- E. Stainless Steel: No. 4 satin luster finish.
- F. Mirror Glass: FS DD-G-451 Type I, Class 1, Quality of 2, 1/4 inch thick with silver coating, copper protective coating and non metallic paint coating complying with FS DD-M-411.
- G. Stainless Steel Mirror: Type 430, 20 gage, bright annealed stainless steel.

3. PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that site conditions are ready to receive work and dimensions are as instructed by the manufacturer.
- B. Beginning of installation means acceptance of existing conditions.

3.2 PREPARATION

- A. Deliver inserts and rough-in frames to site at appropriate time for building-in.
- B. Provide templates and rough-in measurements as required.
- C. Verify exact location of accessories for installation.

3.3 INSTALLATION

- A. Install fixtures, accessories and items in accordance with manufacturers' instructions.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Accessories required to be accessible shall be mounted at heights according to CBC Section 11B-603.5 and as indicated on the drawings.
- D. Toilet paper dispensers and feminine napkin dispensers located on the grab bar side of an accessible toilet room or stall shall not project more than 3 inches from the finished surface of the wall nor be located closer than 1-1/2 inches clear of the tangent point of the grab bar.

3.4 SCHEDULE

- A. Model numbers refer to Bobrick items.

<u>Model Number</u>	<u>Description</u>
B2888	Classic series multi-roll toilet tissue dispenser.
B386	Partition-Mounted Dual Sided Multi Roll Toilet Tissue Dispenser
B72974	Automatic Roll Paper Towel dispenser
3974-57	External 6 volt AC to DC switching power supply for the B72974
B6806 x 30	1-1/2" inch diameter one piece grab bar
B6806 x 42	1-1/2" inch diameter one piece grab bar
B6047	Extra Heavy Duty Shower Curtain Rod
204-2	Vinyl Shower Curtains
B68616	1-1/2" inch diameter shower compartment bar
B165 1830	Framed mirror with tempered glass of custom size
B2111	Classic series soap dispenser
B4390	Recessed Heavy Duty Soap Dish with Bar
B221	Classic series seat cover dispenser
KB311-SSWM	Baby Changing Station, Koala Kare
B5181	Reversible Solid Phenolic Folding Shower Seat
819687	Phenolic Shower/Dressing Area Seat
B985	Vandal Resistant Clothes Hook Strip
B7180	115V AC 8.5 Amps, 50/60 Hz, 1000 Watts, Single Phase
RMDPA-6032	Shower Pan Stone Composite Shower Base, White Slate, 60" L x 32" W x 1-1/16 D, Manufactured by Randolph Morris www.vintagetub.com

END OF SECTION

SECTION 10 51 13

METAL LOCKERS

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Accessible locker units with hinged doors.
- B. Top and filler panels.
- C. Hooks, latches, and hardware.
- D. Attachment hardware.

1.2 REFERENCES

- A. 2010 Americans with Disabilities Act (ADA) Standards for Accessible Design.
- B. ASTM A653 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- C. ASTM A924 - General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
- D. ASTM A1008: Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
- E. CBC – California Building Code, (CCR) California Code of Regulations, Title 24, Part 2, California State Accessibility Standards.

1.3 SYSTEM DESCRIPTION

- A. Lockers: Surface mounted, free standing double tier lockers; with metal base; padlock hasps.
- B. All-Welded Construction: Factory preassemble metal lockers by welding all joints, seams, and connections; with no bolts, nuts, screws, or rivets used in assembly of main locker groups. Factory weld locker groups into one-piece structures. Grind exposed welds flush.

1.4 REGULATORY REQUIREMENTS

- A. Conform to CBC, California Building Code, (CCR) California Code of Regulations, Title 24, Part 2 and the 2010 ADA Standards for Accessible Design for accessibility requirements.
- B. Lockers: Five percent of all lockers shall be made accessible to persons with disabilities. Locations of lockers to be as indicated on drawings.

1.5 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 01 33 00.
- B. Include locker types, sizes, configurations, layout of groups of lockers, accessories, and numbering plan.
- C. Submit manufacturer's installation instructions under provisions of Section 01 33 00.
- D. Submit samples under provisions of Section 01 33 00.
- E. Provide two samples 3 x 6 inches of each color selected on actual base material.

1.6 PROTECTION

- A. Store and protect lockers under provisions of Section 01 61 00.
- B. Protect locker finishes and adjacent surfaces from damage during installation.

2. PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. List Industries, www.listindustries.com.
- B. Lyon Metal Products, www.lyonworkspace.com.
- C. Penco Products, www.pencoproducts.com.
- D. Substitutions: Under provisions of Section 01 25 13.

2.2 MATERIALS

- A. Sheet Steel: ASTM A 1008, Commercial Steel (CS) Type B, ASTM A653, Grade 33, A60 galvanealed coating according to ASTM A924; of the following minimum thicknesses:
 - 1. Body and Shelf : 0.0598 inch.
 - 2. Doors : 0.0747 inch.
 - 3. Door Frames : 0.0747 inch.
 - 4. Hinges : 0.0747 inch.
 - 5. Base, Top, Trim : 0.0598 inch.
 - 6. End Panels : 0.0598 inch.
 - 7. Backs : 0.0478 inch.

2.3 ACCESSORIES

- A. Provide hat shelf on single tier lockers.
- B. Provide aluminum number plates with etched figures.
- C. Provide each locker with two double prong wall hooks.
- D. Provide recessed single point latching handle for padlock. Locking device supplied by Owner.
- E. Doors shall have a magnetic catch to retain unlocked doors in the closed position.
- F. Locker doors shall have rubber bumpers riveted to door strike.
- G. Provide 6 inch high steel bases.
- H. Provide digital lock assembly at all accessible lockers equal to Zephyr, Model 5170 RFID Electronic Lock as manufactured by Zephyr Lock, www.zephyrlock.com.
- I. Provide accessible decal at all accessible lockers equal to Model No. RFH550 as manufactured by Flags and Banners Unlimited, www.flagsbanners.net.
- J. Fasteners: Zinc coated flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

2.4 FABRICATION

- A. Street Locker: 12 inches wide x 12 inches deep x 72 inches high in size; double tier. Total overall height of 72 inches.
- B. Bodies: Formed and flanged with stiffener ribs; electrically spot welded.
- C. Door Frame: Formed channel shape, welded and ground flush, welded to body.
- D. Doors: 1-3/16 inch thickness; channel reinforced top and bottom with intermediate stiffener ribs. Finish edges smooth.
- E. Full Loop Hinges: Three for doors 42 inches and higher, two for doors under 42 inches high. Weld securely to unit body and rivet to unit door.
- F. Number Plates: One for each locker. Mount at top of opening with pop rivets. Numbering sequence as directed by Architect.
- G. Wall Hooks: Mount to locker body with pop rivets.
- H. Provide end panels, filler panels, and metal tops to close off all openings.
- I. Ventilation openings:
 - 1. Street and Box Locker: Die cut diamond perforated side walls and doors.
 - 2. Hall Lockers: Louvered doors.
- J. Finish edges smooth without burrs.

2.5 FINISHES

- A. Clean, degrease, and neutralize metal; prime and finish with two coats of anti-microbial electrostatic baked on powder coat enamel.
- B. Coat locker doors and bodies in one color throughout.
- C. Color: As selected from manufacturer's entire range

3. PART 3 EXECUTION

3.1 PREPARATION

- A. Verify bases are properly sized and located.

3.2 INSTALLATION

- A. Install lockers secure, plumb, square, and in line.
- B. Anchor lockers with appropriate anchor devices to suit materials encountered.
- C. Bolt adjoining locker units together to provide rigid installation.
- D. Install end panels, filler panels, tops.
- E. Install accessories as specified for each locker.
- F. Install one hat shelf in accessible locker at a height of 4'-0" and one at a height of 15 inches above floor line.

END OF SECTION

SECTION 10 82 00

GRILLES AND SCREENS

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aluminum louvers and frames.
- B. Bird screening.

1.2 REFERENCES

- A. AMCA 500 - (Air Movement Council Association) Test Method for Louvers, Dampers, and Shutters.
- B. ASTM B221 - Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.
- C. ASTM A653 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- D. ASTM A924 - General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.

1.3 SYSTEM PERFORMANCE

- A. Fabricate louver to permit 55 percent free area.
- B. Water Penetration: Not more than 0.01 ounces of water per square foot of free area at minimum 700 ft/min face velocity during a 15 minute test period when tested by AMCA 500 test procedures.

1.4 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacture of AMCA certified louvers with five years experience.

1.5 SUBMITTALS

- A. Indicate on shop drawings, layout, elevations, dimensions, and tolerances; head, jamb, and sill details; blade configuration; screening; and frames.
- B. Provide product data on preassembled louvers describing design characteristics, maximum recommended air velocity, free area, materials, and finishes.
- C. Submit samples under provisions of Section 01 33 00.
- D. Submit manufacturer's installation instructions under provisions of Section 01 33 00.

1.6 COORDINATION

- A. Coordinate work of this Section with installation of flashings.
- B. Coordinate work of this Section with mechanical ductwork.

2. PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Airline Products Co., www.airlinelouvers.com.
- B. The C/S Group, www.c-sgroup.com.
- C. The Airolite Co., www.airolite.com.
- D. Substitutions: Under provisions of Section 01 25 13.

2.2 MATERIALS

- A. Aluminum: ASTM B221, 6063 alloy, T5 or T52 temper; extruded shape.
- B. Steel Sheet: ASTM A653, Commercial Steel, Type A, galvanized to G90 zinc coating in accordance with ASTM A924.
- C. Fasteners and Anchors: Stainless steel type.

2.3 ACCESSORIES

- A. Bird Screen: Interwoven wire mesh of aluminum, 0.063 inch diameter wire, 1/2 inch open weave, square design.
- B. Flashings: Of same material as louver frame.
- C. Sealant: Silicone type as specified in Section 07 92 00.

2.4 FABRICATION

- A. Fixed Louvers: Size as noted on the drawing.
- B. Louver Size: 2 inches deep, face measurements as indicated.
- C. Louver Blade: Inverted 'Y' shape; minimum material thickness of 20 gage.
- D. Louver Frame: Channel shape, mechanically fastened corner joints, material thickness of 18 gage.
- E. Head, Jamb, and Sill Flashings: Roll formed to required shape, one piece per location.
- F. Screens: Permanently install screen mesh in shaped frame with reinforced corner construction; screw to louver frame.

2.5 FINISHES

- A. Aluminum Surfaces: Factory Kynar 500 or Hylar 5000 fluorocarbon 3-coat coating system, color as selected.

3. PART 3 EXECUTION

3.1 INSPECTION

- A. Verify that prepared openings and flashings are ready to receive work and opening dimensions are as indicated on drawings.
- B. Beginning of installation means acceptance of existing conditions.

3.2 INSTALLATION

- A. Install louver assembly in accordance with manufacturer's instructions.
- B. Install louvers level and plumb.
- C. Secure louvers in opening framing with concealed fasteners.
- D. Install flashings and align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior.
- E. Install perimeter sealant and backing rod in accordance with Section 07 92 00.
- F. Install bird screening to interior of louver.
- G. Install insect screens to intake louvers. Install bird screens to exhaust louvers.

3.3 CLEANING

- A. Clean surfaces and components.

END OF SECTION

SECTION 11 90 00

MISCELLANEOUS EQUIPMENT

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Sliding service window.

1.2 REFERENCES

- A. 2010 Americans with Disabilities Act (ADA) Standards for Accessible Design.
- B. CBC - California Building Code, (CCR) California Code of Regulations, Title 24, Part 2.

1.3 SUBMITTALS

- A. Submit product data and manufacturer's installation instructions for each item under provisions of Section 01 33 00.

1.4 REGULATORY REQUIREMENTS

- A. Conform to CBC, California Building Code, (CCR), Title 24, Part 2 and the 2010 ADA Standards for Accessible Design for accessibility.

1.5 OPERATION AND MAINTENANCE DATA

- A. Submit warranty, operation, and maintenance data under provisions of Section 01 77 00.

2. PART 2 PRODUCTS

2.1 PRODUCTS

- A. Sliding Service Window: Series C Windows with SST surrounds by Nissen Windows, www.nissenco.com. Window to be factory glazed with clear 1/4 inch laminated glass.
- B. Substitutions: Under provisions of Section 01 25 13.

3. PART 3 EXECUTION

3.1 INSTALLATION

- A. Install equipment in accordance with manufacturer's printed instructions and as indicated on the drawings.
- B. Furnish all necessary hardware, anchors, inserts, connections, and embedded items necessary for proper installation. Coordinate with work of other sections.

END OF SECTION

SECTION 13 11 00

SWIMMING POOL GENERAL REQUIREMENTS

1. PART 1 GENERAL

1.1 WORK INCLUDED

- A. The scope of the work included under this Section of the Specifications shall include swimming pool(s) as illustrated on the Drawings and specified herein. The General and Supplementary Conditions of the Specifications shall form a part and be included under this Section of the Specifications. The Swimming Pool Subcontractor shall provide all supervision, labor, material, equipment, machinery, plant and any and all other items necessary to complete the work. ALL OF THE WORK IN SECTIONS 13 11 00 – 13 11 08 IS TO BE THE RESPONSIBILITY OF ONE EXPERIENCED SWIMMING POOL SUBCONTRACTOR PRIMARILY ENGAGED IN THE CONSTRUCTION OF COMMERCIAL PUBLIC-USE SWIMMING POOLS. A SWIMMING POOL SUBCONTRACTOR SHALL BE CONSIDERED PRIMARILY ENGAGED AS REQUIRED HEREIN IF THE SUBCONTRACTOR DERIVED 50% OF ITS ANNUAL REVENUE FROM PUBLIC-USE SWIMMING POOL CONSTRUCTION FOR EACH OF THE LAST FIVE YEARS. THE SUBCONTRACTOR MUST HAVE ALSO, IN THE LAST FIVE YEARS CONSTRUCTED AT LEAST FIVE (5) COMMERCIALY DESIGNED MUNICIPAL AND PUBLIC-USE SWIMMING POOLS, EACH OF WHICH SHALL HAVE INCORPORATED A MINIMUM SIZE OF 6,000 SQUARE FEET OF WATER SURFACE AREA WITH A CONCRETE AND CERAMIC TILE PERIMETER OVERFLOW GUTTER AND SELF-MODULATING BALANCE TANK. The Swimming Pool Subcontractor shall furnish and install the swimming pool structures, finishes, cantilever forming, swimming pool mechanical and electrical systems, and all accessories necessary for a complete, functional swimming pool system, as herein described. Work shall include start-up, instruction of Owner's personnel, as-built drawings and warranties as required.

1.2 CODES, RULES, PERMITS, FEES

- A. The swimming pools shall be constructed in strict accordance with the applicable provisions set forth by authorities having jurisdiction over swimming pool construction and operation in the State of California.
- B. The Swimming Pool Subcontractor shall give all necessary notices, obtain all permits, and pay all government sales taxes, fees, and other costs in connection with their work; file all necessary plans, prepare all documents and obtain all necessary approvals of governmental departments having jurisdiction; obtain all required certificates of inspection for their work and deliver same to the Designated Representative before request for acceptance and final payment for the work.
- C. The Swimming Pool Subcontractor shall include in the work any labor, materials, services, apparatus, or drawings in order to comply with all applicable laws, ordinances, rules and regulations, whether or not shown on Drawings and/or specified.
- D. The Contractor shall submit all required documents and materials to all Governmental Departments having jurisdiction for any deferred approval items or substituted materials or products to obtain final approval to installation.

1.3 DESCRIPTION OF WORK

- A. Furnish and perform supervision, coordination, all layout, formwork, excavation, hand trim, disposing off-site of all unused material or debris to complete the swimming pool excavation to the dimensions shown on the plans.
- B. Furnish and install complete swimming pool structures, including reinforcing steel and cast-in-place or pneumatically placed concrete walls and floors.
- C. Furnish and install swimming pool finishes, including ceramic tile and marble plaster or other waterproof finishes.
- D. Furnish and install complete swimming pool mechanical system(s), including, but not limited to, circulation systems, filtration systems, pool water heating systems, water chemistry control systems, domestic water fill line systems, booster pump and special effects systems, and all pumps, piping, valves, and connections between system(s) and swimming pool(s).

- E. Furnish and install complete swimming pool electrical system(s) from P.O.C. in Mechanical Room, including, but not limited to, underwater lighting systems, water level control systems, timing systems, scoreboards, special effects systems, control circuitry, motor starters, time clocks, bonding, and all conduits, conductors, contactors, and switches between the system(s) and swimming pool(s).
- F. Furnish and install all swimming pool cantilever forming, deck equipment and required anchors and inserts for the specified equipment as required by code, shown on the Drawings and specified herein.
- G. After the initial filling of the swimming pool system(s), should any repairs, continuing work, or other Subcontractor responsibility require drainage or partial drainage of the swimming pool systems, the Swimming Pool Subcontractor shall be responsible for any subsequent refilling and shall complete the project with the swimming pool system(s) full of water, water in chemical balance, complete in every way, and in full operation.

1.4 ASSIGNED RESPONSIBILITIES AND RELATED WORK

- A. It is the intent of this section of the Specifications to clarify Work responsibilities of the trades directly and indirectly involved in construction of the pool systems. All labor, equipment, materials and supplies furnished by the Swimming Pool Subcontractor and other Subcontractors shall be as directed by the Owner through their Designated Representative.
- B. THE SWIMMING POOL SUBCONTRACTOR SHALL NOT SUBCONTRACT ANY PORTION OF THE SWIMMING POOL CONSTRUCTION OR SWIMMING POOL EQUIPMENT INSTALLATION TO ANYONE OTHER THAN A SUBCONTRACTOR THAT SATISFIES THE REQUIREMENTS OF SECTION 13 11 00
- C. References to "swimming pool systems" shall include the swimming pools, equipment, and accessories.
- D. The Owner will provide one complete water filling of the swimming pool(s), but will not assume any responsibility for the swimming pool system(s) until they have been proved fully operational, complete in every way and accepted by the Designated Representative.

1.5 RESPONSIBILITIES OF THE CONTRACTOR

- A. The Contractor shall grade the swimming pool site(s), establish benchmarks, cut and fill as necessary to provide as level an area as possible at swimming pool deck elevation before swimming pool layout.
- B. The Contractor shall be responsible for horizontal dimensions and grade elevations accurately from established lines and benchmarks (as indicated on the Drawings) and be responsible for those grades.
- C. The Contractor shall provide adequate temporary light, electric power, heat and ventilation per Federal and State OSHA requirements to construct the swimming pool system(s).
- D. The Contractor shall not permit any heavy equipment activity over any area or within five (5) feet of any area under which swimming pool piping is buried. There shall be no exceptions to this requirement.
- E. The Contractor shall keep the swimming pool excavation(s) and swimming pool structure(s) free of construction residue and waste materials of their workmen or Subcontractors, removing said material from the swimming pools as required.
- F. The Contractor shall protect the swimming pool(s) from damage caused by their construction equipment and /or workmen and Subcontractors.
- G. The Contractor shall provide a representative at time of swimming pool start-up to coordinate all trades related to swimming pool system(s).

1.6 RESPONSIBILITIES OF THE MECHANICAL SUBCONTRACTOR

- A. The Mechanical Subcontractor shall be licensed in the State of California and provide written notifications to Swimming Pool Subcontractor and contractor when necessary to excavate and backfill within the swimming pool construction site.
- B. The Mechanical Subcontractor shall not utilize any swimming pool piping trench for installation of any sanitary sewer, storm sewer, domestic water, hot water, chilled water or natural gas line.

- C. The Mechanical Subcontractor shall furnish and install all sanitary sewer piping, including vent stacks (if necessary), for backwash pits, floor drains and floor sinks as required by code, shown on Drawings, and herein specified.
- D. The Mechanical Subcontractor shall furnish and install all storm sewer piping and site drainage systems as required by code, shown on the Drawings, and herein specified.
- E. The Mechanical Subcontractor shall provide a minimum 75 psi water supply for swimming pool construction work within fifty (50) feet of the swimming pool construction site(s).
- F. The Mechanical Subcontractor shall furnish and install reduced pressure backflow protected domestic water lines to P.O.C. within swimming pool Mechanical Room as required by code, shown on the Drawings, and herein specified.
- G. The Mechanical Subcontractor shall furnish and install natural gas piping, pressure regulation and valving to P.O.C. within swimming pool Mechanical Room as required by code, shown on the drawings, and herein specified.
- H. The Mechanical Subcontractor shall furnish and install all ductwork, louvers, and all HVAC equipment within swimming pool Mechanical Room as required by code, shown on the Drawings, and herein specified.
- I. The Mechanical Subcontractor shall provide a representative at time of swimming pool start-up to coordinate work related to swimming pool system(s).

1.7 RESPONSIBILITIES OF THE ELECTRICAL SUBCONTRACTOR

- A. The Electrical Subcontractor shall be licensed in the State of California and shall furnish and install electrical service to swimming pool Mechanical Room sized to accommodate all necessary swimming pool equipment as shown on the Drawings and herein specified.
- B. The Electrical Subcontractor shall furnish any temporary power needed by the Swimming Pool Subcontractor within fifty (50) feet of the swimming pool construction site(s).
- C. The Electrical Subcontractor shall furnish and install all conduits, conductors, starters/disconnects, panels, circuits, switches and equipment as required for lighting, ventilation and HVAC equipment within swimming pool Mechanical Room as required by code, shown on the Drawings, and herein specified.
- D. The Electrical Subcontractor shall furnish and install all conduits, conductors, panels, circuits, switches and equipment for area lighting as required by code, shown on the Drawings, and herein specified.
- E. All equipment, material and installation shall be as required under Division 16 of the Specifications and shall conform to NEC Article 680 (latest revision), State and Local Codes, and as may be required by all authorities having jurisdiction over swimming pool construction within the State of California.
- F. The Electrical Subcontractor shall provide a representative at time of swimming pool start-up to coordinate work related to swimming pool system(s).

1.8 INTENT

- A. It is the intention of these specifications and Drawings to call for finished work, tested and ready for operation. Wherever the work "provide" is used, it shall mean "furnish and install complete and ready for use."
- B. Minor details not usually shown or specified, but necessary for proper installation and operation, shall be included in the work, the same as if herein specified or shown.

1.9 SCHEDULE OF VALUES

- A. Provide a Schedule of Values for all work specified in each of the technical specifications listed in the table below, regardless of whether the work is performed by the swimming pool contractor or others. Values listed shall be fully burdened, with contractor general conditions, overhead, profit and bonds included. Payments for swimming pool work completed shall not be approved until Schedule of Values has been submitted to and approved by Architect.

SWIMMING POOL SCHEDULE OF VALUES			
No.	Section #	Description	Value
1.	13 11 02	Swimming Pool Concrete	
2.	13 11 04	Swimming Pool Ceramic Tile	
3.	13 11 05	Swimming Pool Plaster	
4.	13 11 06	Swimming Pool Equipment	
5.	13 11 07	Swimming Pool Mechanical	
6.	13 11 08	Swimming Pool Electrical	
Total			

1.10 SUBMITTAL PROCEDURES

- A. General: Electronic copies of CAD Drawings of the Contract Drawings will not be provided by Architect for Subcontractor's use in preparing submittals.
- B. Coordination: Coordinate preparation and processing submittals with performance construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for list of submittals and time requirements for schedules performance of related construction activities.
- D. Processing Time: Allow enough time for submittal review, including time for re-submittals as follows. Time for review shall commence on Architect's receipt of submittal.
1. Initial Review: Allow fifteen (15) days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Architect will advise Contract when a submittal being processed must be delayed for coordination.
 2. Concurrent Review: Where concurrent review of submittals by Architect's consultants, Owner, or other parties is required, allow twenty-one (21) days for initial review of each submittal.
 3. Direct Transmittal to Consultant: Where the Contract Documents indicate that submittals may be transmitted directly to Architect's consultants, provide duplicate copy of transmittal to Architect. Submittal will be returned to Architect before being returned to Subcontractor.
 4. If intermediate submittal is necessary, process it in same manner as initial submittal.
 5. Allow fifteen (15) days for processing each submittal.
 6. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.

- E. Identification: Place a title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on title block.
 2. Provide a space on title block to record Subcontractor's review and approval markings and action take by Architect.
 3. Include the following information on title block for processing and recording action taken: (See Attached Sample)
 - a. Project name.
 - b. Date.
 - c. Name and address of Subcontractor.
 - d. Name of Subcontractor.
 - e. Name of Supplier.
 - f. Name of Manufacturer.
 - g. Unique identifier, including revision number.
 - h. Number and title of appropriate Specification Section.
 - i. Drawing number and detail references, as appropriate.
 - j. Other necessary identification.

SUBMITTAL FOR:

SUBMITTAL TO:

SUBCONTRACTOR:

Item Number: _____
Section Number: _____
Section Description: _____
Subcontractor: _____
Supplier: _____
Manufacturer: _____
Product Code: _____
Quantity: _____

Subcontractor Certification:

Contractor's Submittal Stamp:

It is hereby certified that the equipment or material designated in this submittal is proposed to be incorporated in the above-named project and is in compliance with the contract drawings and / or specifications and is submitted for approval.

Certified by: _____

Date: _____

Job Superintendent: _____

Revisions: _____

Architect's Review Stamp and Comments

- F. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract documents on submittal.
- G. On all catalogue or cut sheets identify which model or type is being submitted.
- H. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Product data and shop drawings shall be packaged within a three-ring binder and colored samples shall be packaged on a heavy cardboard. Transmit each submittal using a transmittal form.
 - 1. On an attached separate sheet, prepared on Subcontractor's letterhead, record relevant information, request for data, revisions other than those requested by Architect on previous submittals and deviations from requirements of the Contract documents, including minor variations and limitations. Include the same label information as the related submittal.
 - 2. Include Subcontractor's certification stating that information submitted complies with requires of the Contract Documents.
 - 3. Transmittal Form: Provide locations on form for the following information:
 - a. Project name.
 - b. Date.
 - c. Destination (To:).
 - d. Source (From:).
 - e. Names of Subcontractor, manufacturer, and supplier.
 - f. Category and type of submittal.
 - g. Submittal purpose and description.
 - h. Remarks.
- I. Distribution: Furnish copies of final submittals to manufacturers, Subcontractors, suppliers, fabricators, installers, authorities having jurisdiction and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- J. Use for Construction: Use only final submittals with mark indicating action taken by Architect in connection with construction.

1.11 SUBSTITUTIONS

- A. To obtain approval to use unspecified products, bidders shall submit requests for substitution at least ten (10) days prior to bid date. Requests shall only be considered if they clearly describe the product for which approval is asked, including all data necessary to demonstrate acceptability. All unspecified products and equipment will be considered on an "or equal" basis at the discretion of the Designated Representative. Requests for substitution received after the specified deadline will not be considered. Where a conflict exists between the requirements of the General Conditions / Special Conditions / Division 1 concerning substitutions and the requirements of this Article, this Article (Section 13 11 00, Article 1.10) shall govern.
- B. Where the Swimming Pool Subcontractor proposes to use an item of equipment other than that specified or detailed on the Drawings which requires any redesign of the structure, partitions, foundations, piping, wiring, or any other part of the architectural, mechanical, or electrical layout, all such redesign and all new drawings (stamped by California Licensed Engineer) and detailing required shall be prepared by the Swimming Pool Subcontractor, at their own expense, submitted for review and approval by the Designated Representative prior to bid.

- C. Where such approved deviation requires a different quantity and arrangement of piping, supports and anchors, wiring, conduit, and equipment from that specified or indicated on the Drawings, the Swimming Pool Subcontractor shall furnish and install any such piping, structural supports, controllers, motors, starters, electrical wiring and conduit, and any other additional equipment required by the system, at no additional cost to the Owner.

1.12 SURVEYS AND MEASUREMENTS

- A. The Swimming Pool Subcontractor shall base all measurements, both horizontal and vertical, from benchmarks established by the Contractor. All work shall agree with these established lines and levels. The mechanical Drawings do not give exact details as to elevations of piping, exact locations, etc. and do not show all offsets, control lines, pilot lines and other installation details. Verify all measurements at site and check the correctness of same as related to the work.

1.13 DRAWINGS

- A. Drawings are diagrammatic and indicate the general arrangement of the systems and work included in the Subcontractor. Drawings are not to be scaled. The architectural drawings and details shall be examined for exact dimensions. Where they are not definitely shown, this information shall be obtained from the Designated Representative.

1.14 SWIMMING POOL SUBCONTRACTOR

- A. The swimming pool construction work as herein described and specified in Division 13 of the Project Manual shall be the complete responsibility of a qualified and specifically licensed (C-53 license classification within the State of California) Swimming Pool Subcontractor with extensive experience in commercial public use swimming pool installations.
- B. The Contractor shall require the Swimming Pool Subcontractor to furnish to the Contractor performance and payment bonds in the amount of 100% of the Swimming Pool Subcontractor's bid written by a surety Company properly registered in the State of California and listed by the U.S. Treasury. The expense of the bond(s) is to be borne by the Subcontractor. The Contractor shall clearly specify the amount and requirements of the bond(s) in the Contractor's written or published request for subbids. The Contractor's written or published request for subbids shall also specify that the bond(s) expense is to be borne by the Subcontractor.
- C. Subcontractor certifies that it meets the qualifications and experience requirements established in Swimming Pool General Requirements, Section 13 11 00, as follows:
 - 1. Subcontractor has derived 50% of its annual revenue from public-use swimming pool construction for each of the last five (5) years.
 - 2. Subcontractor has, in the last five (5) years, constructed at least five (5) commercially designed municipal and public-use swimming pools, each of which have incorporated a minimum size of 6,000 square feet of water surface area with a concrete and ceramic tile perimeter overflow gutter and self-modulating balance tank.

3. The following list of projects meet the requirements of section (b) above and the contact as reference by the Contractor, the Awarding Authority of their agent or designee.

- a. Owner: _____
Scope of Project: _____
Contact Person: _____
Phone Number: _____
Architect for Project: _____

- b. Owner: _____
Scope of Project: _____
Contact Person: _____
Phone Number: _____
Architect for Project: _____

- c. Owner: _____
Scope of Project: _____
Contact Person: _____
Phone Number: _____
Architect for Project: _____

- d. Owner: _____
Scope of Project: _____
Contact Person: _____
Phone Number: _____
Architect for Project: _____

- e. Owner: _____
Scope of Project: _____
Contact Person: _____
Phone Number: _____
Architect for Project: _____

D. Swimming Pool Deck Subcontractor other than the swimming pool Subcontractor certifies that it meets the qualifications and experience requirements established in Swimming Pool General Requirements, Section 13 11 00, as follows:

- 1. Subcontract has, in the last five (5) years, constructed at least five (5) commercially designed cantilevered pool decks over perimeter gutters, each of which have incorporated a minimum size of 6,000 square feet of water surface area of the swimming pool.

2. The following list of projects meet the requirements of section (b) above and the contact as reference by the Contractor, the Awarding Authority of their agent or designee.

SWIMMING POOL DECK SUBCONTRACTOR

- a. Owner: _____
 Scope of Project: _____
 Contact Person: _____
 Phone Number: _____
 Architect for Project: _____
- b. Owner: _____
 Scope of Project: _____
 Contact Person: _____
 Phone Number: _____
 Architect for Project: _____
- c. Owner: _____
 Scope of Project: _____
 Contact Person: _____
 Phone Number: _____
 Architect for Project: _____
- d. Owner: _____
 Scope of Project: _____
 Contact Person: _____
 Phone Number: _____
 Architect for Project: _____
- e. Owner: _____
 Scope of Project: _____
 Contact Person: _____
 Phone Number: _____
 Architect for Project: _____

1.15 OPERATING INSTRUCTIONS

- A. The Swimming Pool Subcontractor shall determine from actual samples of pool water supplied by the Owner, the proper water management program necessary for maximum operating efficiency and comfort. The Swimming Pool Subcontractor shall provide the services of experienced personnel familiar with this type of pool system operation, in conformance with Section 13 11 05 of the Specifications.

1.16 MAINTENANCE MANUALS

- A. The Swimming Pool Subcontractor shall provide six (6) bound sets for delivery to the Designated Representative of instructions for operating and maintaining all systems and equipment included in this Contract. Manufacturer’s advertising literature or catalog pictures will not be acceptable for operating and maintenance instructions.
- B. Bound in ring binders shall be all parts lists, periodic maintenance instructions and troubleshooting guidelines for all pool equipment, including but not limited to filters, pumps, controllers, water chemistry control equipment, etc.

1.17 SECURE FROM THE OWNER

- A. A complete Owner-furnished filling of the swimming pools.
- B. The Owner’s assistance, as specified herein, from the time of start-up until final written acceptance of the swimming pool system(s).

- C. Chemicals as required for swimming pool operation after Swimming Pool Subcontractor completes initial water chemistry balance and water treatment during the maintenance period described in Section 13 11 05 of the Specifications.

1.18 WARRANTY

- A. The Swimming Pool Subcontractor shall warrant all swimming pool structures, finishes and systems against defects in material and workmanship for a period of one year after the date of acceptance by the Owner. Any repair or replacement required due to defective material or workmanship will be promptly corrected by the Swimming Pool Subcontractor.

2. PART 2 PRODUCTS

NOT USED

3. PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 13 11 02

SWIMMING POOL CONCRETE

1. PART 1 GENERAL

1.1 WORK INCLUDED

- A. Forming for cast-in-place concrete and shotcrete associated with the swimming pool and pool decks.
- B. Reinforcement for cast-in-place concrete and shotcrete associated with the swimming pool.
- C. Cast-in-place concrete for the swimming pool structures. Do not use water proofing admixture of any kind.
- D. Provide labor, materials and equipment as required to install sealant for al pool deck expansion joints, or any other caulking, as indicated on the aquatic drawings and herein specified.

1.2 QUALITY ASSURANCE

A. Qualifications of Workers:

- 1. The entity performing the work of this Section shall have been successfully engaged in the respective trade for at least five (5) years immediately prior to commencement of the Work.
- 2. For actual construction operations, use only trained and experienced workers with a minimum of three (3) years experience with the materials and methods specified.
- 3. Provide at least one person who shall be present at all times during execution of the work of this Section, with a minimum of five (5) years experience with the type of materials being installed, the referenced standards, and who shall direct all Work performed under this Section.

B. Standards:

- 1. In addition to complying with the California Building Code (latest edition), comply with all pertinent recommendations contained in " Guide to Formwork for Concrete," Publication ACI 347R-14 of the American Concrete Institute.
- 2. In addition to complying with California Building Code (latest edition), comply with all pertinent recommendations contained in "Guide to Presenting Reinforcing Steel Design Details," Publication ACI 315R-18 of the American Concrete Institute.
- 3. In addition to complying with all local codes and regulations, comply with all pertinent recommendations contained in American Society for Testing and materials (ASTM); ASTM C 920 "Standard Specification for Elastometric Joint Sealants."

- C. Tolerances: Construct all swimming pool concrete straight, true, plumb and square within a tolerance horizontally of one in 200 and vertically of one in 2000.

1.3 SUBMITTAL AND SUBSTITUTIONS

- A. Provide submittals in conformance with the requirements of Section 01 33 00.

B. Samples and Certificates, Concrete Reinforcement:

- 1. Provide all data and access required for testing as described in Section 01 45 00 of the Specifications.
- 2. All material shall bear mill tags with heat number identification. Mill analysis and report shall be made available upon request.

3. Material not so labeled and identifiable may be required by the Owner to be tested by the testing laboratory selected by the Owner and at no additional cost to the Owner, in which case random samples will be taken for one series of tests from each 2-1/2 tons or fraction thereof of each size and kind of reinforcing steel.
 4. Design mix from batch plant demonstrating previous use history and associated strengths at 28 days.
 5. The Contractor shall submit a mix design stamped and signed by a licensed engineer for approval by the Owner's Representative prior to any placement of concrete.
- C. Submit proof of qualifications as specified in Article 1.2.A of this Section.
- D. Submit reinforcing shop drawings for pool walls, gutters, floors, dike walls and balance tanks, etc. as shown on the construction drawing.

1.4 PRODUCT HANDLING

- A. Delivery: Deliver materials to the Project Site in the manufacturer's original unopened containers with all labels intact and legible.
- B. Storage: Store materials under cover in a manner to prevent damage and contamination, and store only the specified materials at the Project Site.
- C. Protection: Use all means necessary to protect the swimming pool concrete before, during, and after installation and to protect the installed Work specified in other Sections.
- D. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Owner.

2. PART 2 PRODUCTS

2.1 CONCRETE FORMWORK

- A. Form Materials:
1. Form Lumber: All form lumber in contact with exposed concrete shall be new except as allowed for reuse of forms in Part 3 of this Section, and all form lumber shall be one of the following, a combination thereof, or an equal approved in advance by the Owner's Representative.
 - a. "Plyform," Class I or II, bearing the label of the Douglas Fir Plywood Association; "Inner-Seal" Form as manufactured by Louisiana-Pacific, or approved equal.
 - b. Douglas Fir-Larch, number two grade, seasoned, surfaced four sides.
 2. Form Release Agent: Colorless, non-staining, free from oils; chemically reactive agent that shall not impair bonding of paint or other coatings intended for use.
- B. Ties and Spreaders:
1. Type: All form ties shall be a type which do not leave an open hole through the concrete and which permits neat and solid patching at every hole.
 2. Design: When forms are removed, all metal reinforcement shall be not less than two (2) inches from the finished concrete surface.
 3. Wire Ties and Wood Spreaders: Do not use wire ties or wood spreaders.
- C. Alternate Forming Systems: Alternate forming systems may be used subject to the advance approval of the Owner's Representative.

2.2 CONCRETE REINFORCEMENT

- A. Bars: Bars for reinforcement shall conform to "Specifications for Deformed Carbon-Steel Bars for Concrete Reinforcement," ASTM A-615, Grade 60.
- B. Wire Fabric: Wire fabric shall conform to "Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete", ASTM A1064.
- C. Tie Wire: Tie wire for reinforcement shall conform to "Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete", ASTM A1064 black annealed 16-gauge tie wire.

2.3 CAST-IN-PLACE CONCRETE

- A. Concrete:
 - 1. All concrete, unless otherwise specifically permitted by the Owner's Representative, shall be transit-mixed in accordance with ASTM C94. Concrete for water retaining structures that do not receive a waterproofing finish such as ceramic tile or swimming pool plaster shall receive a topical waterproofing finish.
 - 2. The control of concrete production shall be under the supervision of a recognized testing agency, selected by the Owner.
 - 3. Quality: All concrete shall have the following minimum compressive strengths at twenty-eight (28) days and shall be proportioned within the following limits:
 - a. 4,000 psi minimum compressive strength for cast-in-place concrete swimming pool structures.
 - b. 1" maximum size aggregate.
 - c. 6.0 minimum sacks of cement per cubic yard.*
 - d. Maximum water to cement ratio of 0.40-0.45 max.
 - e. 4" maximum slump.* For estimate only: to be determined by mix design.
 - 4. Cement: All cement shall be Portland Cement conforming to ASTM C-150, Type II or V, and shall be the product of one manufacturer.
 - 5. Aggregates:
 - a. Shall conform to "Standard Specifications for Concrete Aggregates," ASTM C33, except as modified herein.
 - b. Coarse Aggregate: Clean sound washed gravel or crushed rock. Crushing may constitute not more than 30% of the total coarse aggregate volume. Not more than 5% flat, thin, elongated or laminated material nor more than 1% deleterious material shall be present. 1" aggregate graded from 1/4" to 1", fineness modulus 6.90 to 7.40. 1-1/2" graded from 1/2" to 1-1/2", fineness modulus 7.80 to 8.20.
 - c. Fine Aggregate: Washed natural sand of hard, strong particles and shall contain not more than 1% of deleterious material, fineness modulus 2.65 to 3.05.
 - d. Aggregate must be certified, non expansive from a "known" good source.
 - 6. Water: Clean, fresh, free from acid, alkali, organic matter or other impurities liable to be detrimental to the concrete (potable).

7. Admixtures: Admixtures shall be used upon approval of the Owner's Representative.
 - a. Air-entraining admixture: Conform to ASTM C260.
 - b. Water-reducing admixture: Conform to ASTM C494.

- B. Construction Joints: Use keyform for slab pour joints. Either preformed galvanized or PVC construction joint forms of a standard manufacturer may be used. Install per manufacturer's recommendations and tool edges of slabs.

- C. Waterstops: PVC bulb-type for use between concrete pours / lifts, conforming with ASTM D 570, D 624, and D 638. Provide in configuration(s) as recommended by manufacturer for specific application. Greenstreak, W.R. Meadows, or approved equal.

- D. Curing Materials:
 1. Liquid Membrane (covered slab): Chlorinated rubber membrane forming, curing-sealing compound conforming to ASTM C309.
 2. Liquid Membrane (exposed slab): Clear methyl and butyl methacrylate non-staining, membrane forming, curing-sealing compound conforming to ASTM C309.

- E. Cement Grout and Drypack:
 1. Cement Grout: Mix 1 part by volume of Portland Cement, 1/2 part by volume of water and fine aggregate enough to make mixture flow under its' own weight.
 2. Drypack: Mix 1 part by volume of Portland Cement, 1/2 part by volume of water and fine aggregate enough to make a stiff mix that will mold into a ball. Mix no more than can be used in 30 minutes.

2.4 JOINT SEALANT MATERIALS

- A. Caulking: Multipart, non-sag gun grade polyurethane-based sealant meeting the requirements of ASTM C920-02, Type S or M, Mamemco International, Pecora, Sika Corp., Sonneborn Building Products, Tremco or approved equal. Self-leveling caulking materials are not allowed.

- B. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

- C. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

- D. Sealant Backer Rod: Provide compressible polyethylene or polyurethane backer rod as recommended by the sealant manufacturer.

- E. Bond Breaker Tape: Provide polyethylene tape or other plastic tape as recommended by sealant manufacturer, to be applied to sealant-contact surfaces where bond to substrate or joint filler must be avoided for proper performance of sealant.

- F. Sand: Cover the surface of the caulking with #30 silica sand.

2.5 OTHER MATERIALS

- A. All other materials, not specifically described but required for proper completion of the work of this Section, shall be as selected by the Contractor subject to the advance review by the Owner's Representative.

3. PART 3 EXECUTION

3.1 SURFACE CONDITIONS

A. Inspection:

1. Prior to all Work of this Section, carefully inspect the installed Work of other trades and verify that all such Work is complete to the point where this installation may properly commence.
2. Verify that all Work may be constructed in accordance with all applicable codes and regulations, the referenced standards, and the original design.

B. Discrepancies:

1. In the event of discrepancy, immediately notify the Owner's Representative.
2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.
3. Failure to notify the Owner's Representative and give written notice of discrepancies shall constitute acceptance by the Contractor of existing conditions as fit and proper to receive work.

3.2 CONCRETE FORMWORK

A. Construction of Forms:

1. General: Construct all required forms to be substantial, sufficiently tight to prevent leakage of concrete paste, and able to withstand excessive deflection when filled with wet concrete.
2. Layout:
 - a. Form for all required cast-in-place concrete to the shapes, sizes, lines and dimensions indicated on the Drawings.
 - b. Exercise particular care in the layout of forms to avoid necessity for cutting concrete after placement.
 - c. Make proper provisions for all openings, offsets, recesses, anchorages, blocking and other features of the Work as shown or required.
 - d. Perform all forming required for Work of other trades and do all cutting and repairing of forms required to permit such installation.
 - e. Carefully examine the Drawings and Specifications and consult with other trades as required relative to providing for pipe and conduit penetrations, reglets, chases and other items in the forms.
3. Imbedded Items: Set all required steel frames, angles, bolts, inserts and other such items required to be anchored in the concrete prior to concrete being placed.
4. Bracings:
 - a. Properly brace and tie the forms together so as to maintain position and shape and to ensure safety to workmen.
 - b. Construct all bracing, supporting members and centering of ample size and strength to safely carry, without excessive deflection, all dead and live loads to which they may be subjected.
 - c. Properly space the forms apart and securely tie them together, using metal spreader ties that give positive tying and accurate spreading.

5. Wetting: Keep forms sufficiently wetted to prevent joints from opening up before concrete is placed.
- B. Plywood Forms:
1. Design: Nail the plywood panels directly to studs and apply in a manner to minimize the number of joints.
 2. Joints: Make all panel joints tight butt joints with all edges true and square.
- C. Footing Forms:
1. Wood Forms: All footing forms shall be wood unless otherwise specifically approved by the Owner's Representative, or as specified in paragraph 3.2(C)(2).
 2. Earth Forms:
 - a. Side walls for footings may be of earth provided the soil will stand without caving and the sides of the bank are made with a neat cut to the minimum dimensions indicated on the Drawings.
 - b. For excavation and backfill of earth forms, conform with applicable provisions of Section 13 11 01.
- D. Reuse of Forms:
1. Reuse of forms shall be subject to advance approval of the Owner's Representative.
 2. Except as specifically approved in advance by the Owner's Representative, reuse of forms shall in no way delay or change the schedule for placement of concrete from the schedule obtainable if all forms were new.
 3. Except as specifically approved in advance by the Owner's Representative, reuse of forms shall in no way impart less structural stability to the forms nor less acceptable appearance to finished concrete.
- E. Removal of Forms:
1. General:
 - a. In general, side forms of footings may be removed seven (7) days after placement of concrete, but time may be extended if deemed necessary by the Owner's Representative.
 - b. Forms for footings, foundations, grade beams, slabs, walls, and other formed concrete may be removed fourteen (14) days after placement of concrete.
 2. Removal:
 - a. Use all means necessary to protect workers, passersby, the installed Work of other trades and the complete safety of the structure.
 - b. Cut nails and tie wires or form ties off flush, and leave all surfaces smooth and clean.
 - c. Remove metal spreader ties on exposed concrete by removing or snapping off inside the wall surface and pointing up and rubbing the resulting pockets to match the surrounding areas.
 - d. Flush all holes resulting from the use of spreader ties and sleeve nuts using water, and then solidly pack throughout the wall thickness with cement grout applied under pressure by means of a grouting gun; grout shall be one-part Portland Cement to 2-1/2 parts sand; apply grout immediately after removing forms.

3.3 CONCRETE REINFORCEMENT

A. Bending:

1. General:

- a. Fabricate all reinforcement in strict accordance with the Drawings.
- b. Do not use bars with kinks or bends not shown on the Drawings.
- c. Do not bend or straighten steel in a manner that will injure the material. (When opposite end is already encased in concrete.)

2. Design:

- a. Bend all bars cold.
- b. Make bends for stirrups and ties around a pin having a diameter of not less than two (2) times the minimum thickness of the bar.
- c. Make bends for other bars, including hooks, around a pin having a diameter of not less than six (6) times the minimum thickness of the bar.

B. Placing:

1. General: Before the start of concrete placement, accurately place all concrete reinforcement, positively securing and supporting by concrete blocks, metal chairs or spacers, or by metal hangers.

2. Clearance:

- a. Preserve clear space between bars of not less than one and one-half (1-1/2) times the nominal diameter of the round bars.
- b. In no case let the clear space be less than one and one-half (1-1/2) inches nor less than one and one-third (1-1/3) times the maximum size of the aggregate.
- c. Provide the following minimum concrete covering of reinforcement:
 - 1) Concrete deposited against earth: three (3) inches minimum.
 - 2) Concrete below grade deposited against forms: two (2) inches minimum.
 - 3) Concrete elsewhere: As indicated on Drawings or otherwise approved by the Owner's Representative.

3. Splicing:

a. Horizontal Bars:

- 1) Place bars in horizontal members with minimum lap at splices sufficient to develop the strength of the bars.
- 2) Bars may be wired together at laps except at points of support of the member, at which points preserve clear space described above.
- 3) Whenever possible, stagger the splices of adjacent bars.
- 4) Splice forty (40) bar diameters minimum.
- 5) Provide non-contact lap slices for shotcrete.

- b. Wire Fabric: Make all splices in wire fabric at least one and one-half (1-1/2) meshes wide.
 - c. Other Splices: Make only those other splices that are indicated on the Drawings or specifically approved by the Owner's Representative.
- 4. Dowels: Place all required steel dowels and securely anchor them into position before concrete is placed.
 - 5. Obstructions: In the event conduits, piping, inserts, sleeves and other items interfere with placing reinforcement as indicated on the Drawings or otherwise required, immediately consult with the Owner's Representative and obtain approval of a new procedure prior to placing concrete.
- C. Cleaning Reinforcement: Steel reinforcement, at the time concrete is placed around it, shall be free from rust scale, loose mill scale, oil, paint and all other coatings which will destroy or reduce the bond between steel and concrete. Bend down all tie wire away from the top of the pool deck. Maintain a 2" clear from the top of the concrete to the tie wire.

3.4 SHOTCRETE REINFORCEMENT

- A. The maximum size of reinforcement shall be No. 5 bars unless it can be demonstrated by preconstruction tests that adequate encasement of larger bars can be achieved. When No. 5 or smaller bars are used, there shall be a minimum clearance between parallel reinforcement bars of 2-1/2 inches (64 mm). When bars larger than No. 5 are permitted, there shall be a minimum clearance between parallel bars equal to six diameters of the bars used. When two curtains of steel are provided, the curtain nearest the nozzle shall have a minimum spacing equal to 12 bar diameters and the remaining curtain shall have a minimum spacing of six bar diameters.
- B. Lap splices in reinforcing bars shall be by the non-contact lap splice method with at least 2 inches clearance between bars. The enforcement agency may permit the use of contact lap splices when necessary for the support of the reinforcing provided it can be demonstrated by means of preconstruction testing, that adequate encasement of the bars at the splice can be achieved, and provided that the splices are placed so that a line through the center of the two spliced bars is perpendicular to the surface of the shotcrete work.

3.5 CAST-IN-PLACE CONCRETE

- A. Conveying and Placing Concrete:
 - 1. Before placing concrete, mixing and conveying equipment shall be well cleaned, and the forms and space to be occupied by concrete shall be thoroughly cleaned and wetted. Ground water shall be removed until the completion of the work.
 - 2. No concrete shall be placed in any unit of work until all formwork has been completely constructed, all reinforcement has been secured in place, all items to be built into concrete are in place, and form ties at construction joints tightened.
 - 3. Concrete shall be conveyed from mixer to place of final deposit in such a way to prevent the separation or loss of ingredients. It shall be placed as nearly as practicable in its' final position to avoid rehandling or flowing. Concrete shall not be dropped freely where reinforcing bars will cause segregation, nor shall it be dropped freely more than six (6) feet. Use tremies, spouts and dump boxes in deep sections. Vibrators are not acceptable for facilitating concrete transport.
 - 4. Concrete shall be tamped and spaded to insure proper compaction into all parts of forms and around reinforcement. A mechanical vibrator shall be used to thoroughly compact the concrete. Vibration must be by direct action in the concrete and not against forms or reinforcement.
 - 5. Mixing and transport time as indicated in ASTM C94 is required. If air temperatures are between 85° and 90° F the delivery time is to be reduced to 75 minutes. When air temperatures is in excess of 90° F the delivery time should be reduced to 60 minutes.
 - 6. Truck mixes without batch certificates will be rejected.

- B. Construction Joints / Expansion Joints: Construction joints and expansion joints shall be provided at locations and in the manner shown on the Drawings. With exception of existing concrete / new shotcrete joints, use PVC bulb-type waterstops appropriate for design condition between all concrete pours / lifts to avoid cold joints. Waterstops shall be placed in such a way to protect reinforcing steel from rust and oxidation. All expansion joints must be the full depth of the concrete section in which they are located.
- C. Slab Finishes: Concrete slabs shall be compacted and screeded uniformly to grades shown. Push large aggregates below the surface with a screen tamper, screed and bull float. As soon as the surface becomes workable, it shall be wood floated, then finished as indicated on the Drawings to a uniform smooth, true surface in a neat and workmanlike manner. Carefully coordinate slab finish requirements with other trades (ceramic tile, pool plaster) to insure concrete finish is appropriate substrate for final finish material.
1. Contractor shall provide three mock-up deck samples, minimum 3'x 3', with a wedge anchor installed in one sample. These (3) samples shall be constructed; one with a light broom finish, one (1) with a medium broom finish and one (1) with a heavy broom finish for determination and selection of an appropriate deck finish. Each sample shall be edged on all four sides to demonstrate a 3/4" radius edge. Anchor installation shall demonstrate acceptable interface between anchor and the top of deck. Deck samples shall remain on job site through final inspection for reference.
 2. Pool Floor Slab: Heavy Wire Broom Finish.
- D. Protection and Curing:
1. Concrete shall be protected from injurious action of the elements and defacement of any nature during construction.
 2. All forms must be kept wet to prevent drying out of the concrete.
 3. All concrete surfaces including footings must be kept wet for at least seven (7) days after concrete is placed.
 4. Apply the appropriate curing materials, as specified in 2.3 of this Section, immediately after finishing slabs. Application shall be as specified by the manufacturer.
- E. Form Removal:
1. Take care in removing forms so that surfaces are not marred or gouged and that corners are true, sharp and unbroken.
 2. No steel spreaders, ties or other metal shall project from or be visible on any concrete surfaces.
- F. Defective Work:
1. Should the strength of any concrete for any portion of the work indicated by tests of molded cylinders and core tests fall below minimum 28 days strength specified or indicated, concrete will be deemed defective work and shall be replaced.
 2. Concrete work that is not formed as indicated, is not true to intended alignment, not plumb or level where so intended, not true to intended grades or elevations, not true to specified or selected finish, contains sawdust shavings, wood, or embedded debris, which exhibits cracks or contains fine or coarse sulfide particles, or expansive aggregates detrimental to performance or appearance of the concrete shall be deemed defective.
 3. Promptly perform work required to replace and properly clean (by sandblasting if necessary) any defective concrete panels (control joint or expansion joint to control joint or expansion joint), at Contractor's expense, including all expense of additional inspection, tests, or supervision made necessary as a result of defective concrete.

3.6 EXPANSION JOINTS

- A. Temperatures: Do not install sealants when air temperature is less than 40°F.
- B. Tooling: Tool exposed joints to a slightly concave surface using slicking materials recommended by the manufacturer. The tooling procedure shall press sealant against the sides of the joint. No materials shall be left "feathered" out or smeared on the abutting materials. Completed joints shall have a uniform professional appearance.
- C. Joint Construction: Sealant joint width, thickness and cross-sectional profile to be constructed in strict accordance with the sealant manufacturer's recommendations.
- D. Sand: At the appropriate time cover the sealant with sand to provide a sanded finish.

3.7 CLEAN-UP

- A. Upon completion of the Work of this Section, immediately remove all swimming pool concrete materials, debris and rubbish occasioned by this Work to the approval of the Owner's Representative.

END OF SECTION

SECTION 13 11 04

SWIMMING POOL CERAMIC TILE

1. PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 WORK INCLUDED

- A. Furnish and install all swimming pool ceramic tile detailed on the Drawings, including, but not limited to, the following:
 - 1. Waterline Face Tile
 - 2. Lane Line / Target Tile.
 - 3. Trim Tile (at 4'-6" depth and stairs)
 - 5. Depth / Caution Marker Tile (at waterline)
 - 6. Depth / Caution Marker Tile on Deck.

1.3 QUALITY ASSURANCE

- A. Qualifications of Workers:
 - 1. The entity performing the work of this Section shall have been successfully engaged in the respective trade for at least five (5) years immediately prior to commencement of the Work.
 - 2. For actual construction operations, use only trained and experienced workers with a minimum of three (3) years experience with the materials and methods specified.
 - 3. Provide at least one person who shall be present at all times during execution of the work of this Section, with a minimum of five (5) years experience with the type of materials being installed, the referenced standards, and who shall direct all Work performed under this Section.
- B. Standards: In addition to complying with all pertinent codes and regulations:
 - 1. Manufacture of all tile shall be in accordance with ANSI A-137.1.
 - 2. Install ceramic tile in accordance with the recommendations contained in the 2021 "Handbook for Ceramic Tile Installation" of the Tile Council of America, Inc.
- C. Tolerances: Install all swimming pool ceramic tile straight, true, plumb and square within a tolerance horizontally of one in 200 and a tolerance vertically of one in 500. Waterline and gutter bullnose tile shall be level to 1/8" (+/- 1/16") around entire perimeter of swimming pools.

1.4 SUBMITTALS AND SUBSTITUTIONS

- A. Provide submittals in conformance with the requirements of Section 01 33 00.
- B. Samples: Submit samples of each color and pattern in the specified groups. Character samples can be representative for review prior to screening of actual tile.
- C. Master Grade Certificate: Prior to opening ceramic tile containers, submit a Master Grade Certificate, signed by the manufacturer of the tile used and issued when the shipment is made, stating the grade, kind of tile, identification marks for the tile containers, and the name and location of the Project.

- D. Specifications: Submit manufacturer's recommended installation specifications for the Work.
- E. Submit proof of qualifications as specified in Article 1.3.A of this Section.

1.5 PRODUCT HANDLING

- A. Delivery: Deliver all materials to the Project Site in the manufacturer's original unopened containers with all labels intact and legible.
- B. Storage: Store all materials under cover in a manner to prevent damage and contamination, and store only the specified materials at the Project site.
- C. Protection: Use all means necessary to protect swimming pool ceramic tile before, during and after installation and to protect the installed Work specified in other Sections.
- D. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Owner's Representative.

2. PART 2 - PRODUCTS

2.1 TILE

- A. Waterline Face Tile: (Replace any damaged to match existing)
 - 1. Material: All waterline face tile shall be glazed ceramic tile (Group III standard) as manufactured by Dal-Tile or approved equal.
 - 2. Size: 6 x 6 inches.
 - 3. Color: Dal-Tile #O-129, 'Sky Blue'. Contact Kylee Midura kylee.midura@daltile.com (858)344-0019.
- B. Lane Line / Target Tile:
 - 1. Material: Group 3 quality, frost proof unglazed ceramic mosaic tile with absorption rate of less than 1% as manufactured by Dal-Tile or approved equal.
 - 2. Size: 1 x 1 inches.
 - 3. Color: Dal-Tile #D311, 'Black'.
- C. Trim Tile (at stairs and at 5'-0" depth):
 - 1. Material: Group 3 quality, frost proof unglazed ceramic mosaic tile with absorption rate of less than 1% as manufactured by Dal-Tile or approved equal.
 - 2. Size: Stairs: 1 x 1 inches, with S-812 quarter round. Color: Dal-Tile #D621 'Nautical Blue.'
- D. Depth / Caution Marker Tile (at waterline tile):
 - 1. Material: Group 3 quality, frost proof unglazed ceramic mosaic tile with absorption rate of less than 1% as manufactured by Dal-Tile or approved equal.
 - 2. Size: 1 x 1 inches.
 - 3. Color: Dal-Tile #D-311, 'Black' letters and numbers on #D129, "Sky Blue".

E. Depth / Caution Marker Tile (at deck):

1. Material: Group 3 quality, frost proof unglazed non slip ceramic mosaic tile with absorption rate of less than 1% as manufactured by Inlays or approved equal.
2. Size: 6 x 6 inches.
3. Color: Inlays Ft. and In. Series. White field tile with black letters and numbers.

2.2 MORTAR

- A. Sand for Mortar: Comply with requirements of fine aggregate for concrete.
- B. Cement: Type I Portland Cement, conforming to ASTM C150.
- C. Hydrated Lime: Conforming to ASTM C206 or 207, Type S.
- D. Water: From a potable source.
- E. Mortar shall meet ASTM C270 standards.

2.2 THIN SET MORTAR

- A. Laticrete 254 Platinum. Laticrete, Custom or equal.
- B. Water: From a potable source.
- C. Mortar shall meet ASTM C627 standards.

2.3 GROUT

- A. All tile grout shall be waterproof grout complying with the recommendations of referenced standards. Grout color shall be grey for dark backgrounds, white for light backgrounds (verify colors with Architect).

2.4 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation of ceramic tile as indicated on the Drawings, shall be new, first quality of their respective kinds, and subject to the approval of the Designated Representative.

3. PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Inspection:

1. Prior to all Work of this Section, carefully inspect the installed Work of other trades and verify that all such Work is complete to the point where this installation may properly commence.
2. Verify that ceramic tile can be installed in accordance with the original design and all referenced standards.

B. Discrepancies:

1. In the event of discrepancy, immediately notify the Designated Representative.
2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.
3. Failure to notify the Designated Representative and give written notice of discrepancies shall constitute acceptance by the Contractor of existing conditions as fit and proper to receive its Work.

3.2 INSTALLATION

A. Method:

1. Install all ceramic tile in strict accordance with installation method P601-02 of the 2021 Handbook for Ceramic Tile Installation of the Tile Council of America, Inc.
2. Be certain to install all ceramic tile perfectly level, flush, plumb, and to the finish grades and elevations indicated on the Drawings.

B. Interface:

1. Carefully establish and follow the required horizontal and vertical elevations to insure proper and adequate space for the work and materials of other trades. And cooperate as required with other trades to insure proper and adequate interface of ceramic tile Work with the Work of other trades.

3.3 GROUTING

A. Follow grout manufacturer's recommendations as to grouting procedures and precautions.

B. Remove all grout haze, observing grout manufacturer's recommendations as to use of acid and chemical cleaners.

3.4 EXTRA STOCK

A. Provide one (1) unopened box of extra tile for 2.1C and 2.1D for Owners use at a future time.

3.5 CLEAN-UP

A. Upon completion of the swimming pool ceramic tile installation, thoroughly clean and polish the exposed surfaces of tile work. Completely clean work area of debris and rubbish occasioned by this Work and dispose of to the approval of the Designated Representative.

END OF SECTION

SECTION 13 11 05

SWIMMING POOL PLASTER

1. PART 1 GENERAL

1.1 WORK INCLUDED

- A. Swimming pool plaster and waterproofing of swimming pool structures as indicated on the Drawings and herein specified.
- B. Start-up and operation instructions to Owner's operations and maintenance personnel and properly balance swimming pool water chemistry until the Owner takes occupancy.

1.2 QUALITY ASSURANCE

A. Qualifications of Workers:

- 1. The entity performing the work of this Section shall have been successfully engaged in the respective trade for at least five (5) years immediately prior to commencement of the Work.
- 2. For actual construction operations, use only trained and experienced workers with a minimum of three (3) years experience with the materials and methods specified.
- 3. Provide at least one person who shall be present at all times during execution of the work of this Section, with a minimum of five (5) years experience with the type of materials being installed, the referenced standards, and who shall direct all Work performed under this Section.

- B. Standards: Swimming pool plaster shall conform with requirements of Chapter 31B of California Building Code, latest edition. In addition, meet requirements of applicable portions of most current edition of the "Technical Manual," National Plasterers Council, Mission Viejo, California.

C. Start-up:

- 1. Furnish a swimming pool water chemistry consultant, with a minimum of five (5) years experience, possessing either AFO (Aquatic Facility Operator) or CPO (Certified Pool Operator) certification(s), to supervise and properly balance swimming pool water chemistry.
- 2. Demonstrate to the Owner that all systems are fully operational and that calcium hardness, total alkalinity, chlorine residual and pH levels are within specified limits.
- 3. Standards: Furnish labor and chemicals as required to condition the water properly to the following specifications:
 - a. Calcium Hardness: 200-400 parts per million (PPM)
 - b. Total Alkalinity: 80-100 PPM, minimum
 - c. Chlorine Residual: 1.00 to 2.00 PPM
 - d. pH Factor: 7.2 to 7.6

1.3 SUBMITTALS AND SUBSTITUTIONS

- A. Provide submittals in conformance with the requirements of Section 01 33 00.
- B. Submit proof of qualifications as specified in Article 1.2 and 1.2.C.1 of this Section.

1.4 PRODUCT HANDLING

- A. Delivery: Deliver materials to the Project Site in the manufacturer's original unopened containers with all labels intact and legible.
- B. Storage: Store materials under cover in a manner to prevent damage and contamination, and store only the specified materials at the Project Site.
- C. Protection: Use all means necessary to protect the swimming pool plaster before, during, and after installation and to protect the installed Work specified in other Sections.
- D. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Owner.

1.5 ENVIRONMENTAL CONDITIONS

- A. No plastering shall be done under unsuitable conditions of weather or temperature. No plastering shall be done when prevailing temperature is 40 degrees Fahrenheit or less.
- B. Do not install plaster during rain and, if rain commences after plastering has begun, immediately protect the plaster from rain by all means necessary until the plaster has set.
- C. Do not install plaster during wind greater than 10 mph and, if wind commences after plastering has begun, immediately protect the plaster from wind by all means necessary until the plaster has set.

2. PART 2 PRODUCTS

2.1 CEMENT / AGGREGATE

- A. Luna Quartz® tiny pebble finish by Wet Edge Technologies. Altima® quartz finish by Wet Edge Technologies. Pebble-Fina® pool finish by Pebble Technologies.

2.2 COLOR

- A. All swimming pool plaster shall be white in color. Wet Edge Technologies shall be Luna Quartz® "Polar White". Wet Edge Technologies shall be Altima® "White". Pebble Technology shall be Pebble-Fina® "Classico". Contractor to obtain written approval on selected pebble color from the local Health Department prior to installation. Submit cut sheet, color sample and written approval for review by Architect and Owner.

2.3 WATER

- A. Water for swimming pool plaster shall be clean and free from injurious amounts of acid, alkali, and organics.

2.4 GUTTER/SURGE CHAMBER WATERPROOFING

- A. Xypex, Miracote Miraflex Membrane C, or approved equal. Mix and apply per manufacturer's recommendations for specific application. Color shall be Gray.

3. PART 3 EXECUTION

3.1 SURFACE CONDITIONS

- A. Inspection:
 - 1. Prior to Work of this Section, carefully inspect the installed Work of other trades and verify that all such Work is complete to the point where this installation can properly commence.

2. Verify that swimming pool plaster can be installed in accordance with the original design and all referenced standards, including proprietary application techniques and application training/certifications.

B. Discrepancies:

1. In the event of discrepancy, immediately notify the Owner's Representative.
2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.
3. Failure to notify the Owner's Representative and give written notice of discrepancies shall constitute acceptance by the Contractor of existing conditions as fit and proper to receive the Work.

3.2 INSTALLATION OF GUTTER/SURGE CHAMBER WATERPROOFING

- A. Provide two (2) coats of the specified gutter and surge chamber waterproofing prior to plastering the swimming pool. Prepare surfaces to receive waterproofing and cure in conformance with manufacturer's recommendations. Provide steel trowel application method to ensure uniform smooth, dense surface finish.

3.3 REMOVAL OF EXISTING TILE AND PLASTER SURFACES

- A. Surfaces to receive new plaster and tile finishes shall have existing finishes, including tile and plaster, removed by use of chipping gun or pick down to original bare concrete/shotcrete, exposing a clean rough surface.

3.4 INSTALLATION OF POOL PLASTER

A. Outdoor Pools or Spas:

1. Completion of other work: DO NOT commence plastering of swimming pool(s) or spa(s) until the following conditions have been met:
 - a. The Health Department and/or other governing agencies have approved the pool(s) and/or spas for plaster.
 - b. All concrete pool deck construction is complete and the pool decks have been thoroughly cleaned.
 - c. All landscaping in areas adjacent to the pool(s) or spa(s) is complete and the landscape irrigation system is operable.
 - d. All painting in the pool area is complete.
 - e. All welding and grinding in locations adjacent to the pool area are complete.
 - f. The backwash sewer connection is complete.
 - g. Pool(s) and/or spa(s) area(s) perimeter fencing installation is complete.
 - h. All trash and debris have been removed from areas adjacent to the pool(s) or spa(s), particularly those areas that are normally upwind from the pool(s) or spa(s).
 - i. All dust raising construction and/or activities in areas adjacent to the pool(s) or spa(s) are complete or mitigated.
 - j. The circulation pump(s) is/are operational.
 - k. The mechanical system has been flushed sufficiently to remove all dirt and debris from the piping system.

- l. All necessary chemicals (Chlorine, pH adjuster, Sodium Bicarbonate and Calcium Chloride or any other required chemicals) are on site and ready for use.
- m. Obtain written approval from the Owner and the Architect.

B. Indoor Pools or Spas:

1. Completion of Other Work: DO NOT commence plastering of swimming pool(s) or spa(s) until the following conditions have been met:
 - a. The Health Department has approved the pool(s) and/or spa(s) for plaster.
 - b. All work above the pool(s) and/or spa(s) is complete.
 - c. All painting in the pool area is complete.
 - d. All welding and grinding in locations adjacent to the pool area are complete.
 - e. The backwash sewer connection is complete.
 - f. All concrete pool deck construction is complete and the pool decks have been thoroughly cleaned.
 - g. The circulation pump(s) is/are operation.
 - h. The mechanical system has been flushed sufficiently to remove all dirt and debris from the piping system.
 - i. All necessary chemicals (Chlorine, Acid, Sodium Bicarbonate and Calcium Chloride) are on site and ready to use.
 - j. Obtain written approval from the Owner and the Architect.

C. Contractor accepts all liability from damage done to the pool plaster if the pool(s) or spa(s) is (are) plaster before the completion of the above listed items or without the written approval of the Owner and the Architect.

D. POOL PLASTER AUTHORIZATION FORM:

1. The pool(s) and or spa(s) at Honeybee Pool is/are hereby approved for the installation of the pool plaster. Pursuant to the requirements of specification section 13 11 05, paragraph 3.3.

Owner

Date

Architect / Project Manager

Date

E. Preparation:

1. Do not apply plaster over dirt, rust, scale, grease, moisture, scuffed surfaces or conditions otherwise detrimental to the formation of a durable plaster finish.
2. Consult with manufacturer on application to specific surfaces being treated. Follow manufacturer's recommendation for curing of cast-in-place concrete or shotcrete surfaces prior to application of plaster.

3. Protect ceramic tile, decking, deck equipment, gratings, fittings and other items by suitable covering or masking.
4. Mask or remove all hardware, hardware accessories, machined surfaces, plates, lighting fixtures and similar items in place not to receive pool plaster. Following completion of plaster for each space or area remove masking. Re-install all removed items utilizing workers skilled in the trades involved.

F. Application:

1. Finish shall be applied to a uniform thickness of 3/8" to 1/2" over the entire surface. The walls shall be scratch-coated followed by a finish coat. Material applied to the floor after the walls have been applied shall be accelerated to assure uniform setting time throughout the pool surface.2. Float the plaster to a uniform plane and trowel to a smooth, dense, impervious surface using extreme care to avoid stains.
3. Take special care in finishing around pool fittings, making sure to mask off or plug openings so as not to fill such openings with excess plaster. Be certain to completely enclose pool fittings with plaster to insure a leak-proof seal around pipes, fittings, lights, anchors, etc.
4. Accurately interface with the finish planes of items installed by other trades.
5. Quartz and pebble plater finish is to be applied by a licensed applicator as approved by the manufacturer, and in accordance with manufacturer's training.

3.5 CURING

- A. Preparation: Anticipate the need for required equipment and have all such equipment immediately available for use upon completion of pool plastering.
- B. Pool Filling:
 1. After the plaster has sufficiently dried and before drying has proceeded to a damaging point, cure the plaster by gradually filling the pool with water, preventing all damage to finished plaster surfaces.
 2. Flow the water continuously until the pool is filled.
 3. When the weather is hot and/or water pressure is low, keep the pool walls damp while the pool is filling.
 4. Coordinate with Contractor to ensure that the pool is continuously monitored while filling to prevent overflow.

3.6 EQUIPMENT ACTIVATION

- A. All water chemistry and filtration mechanical equipment shall be operational upon filling of pool after plaster. Chemicals and other related support items as supplied by Contractor, shall be in supply at start-up.
- B. For the first fourteen (14) calendar days after completion of the pool plaster, brush all plastered surfaces at least twice a day and coordinate with General Contractor to ensure that the plaster is carefully maintained after the initial fourteen-day period. In addition, coordinate with the Contractor to ensure that pool filtration equipment is continuously running during the initial fourteen-day period.
- C. Start-up and provide qualified personnel to operate pool equipment for a period not less than fourteen (14) days after the pool is placed in operation, or until the Owner takes occupancy of the facility or letter of substantial completion. During this time, Contractor shall instruct and supervise the Owner's personnel in the various operating and maintenance techniques involved. Contractor shall be responsible for supply of chemicals during this not less than fourteen (14) day period and at time of turnover to Owner, chemical storage tanks shall be full. (Owner's personnel shall be fully trained and capable of assuming swimming pool maintenance tasks, training may begin before Owner takes occupancy).

3.7 CLEAN-UP

- A. Upon completion of swimming pool plaster, remove all materials, equipment and debris occasioned by this Work and leave the job site in a clean and presentable condition. Perform all such clean-up to the approval of the Owner's Representative.

3.8 WARRANTY

- A. All applicators must provide a minimum of five (5) year warranty for application and workmanship additional to the manufacturer's warranty for product.

END OF SECTION

SECTION 13 11 06

SWIMMING POOL EQUIPMENT

1. PART 1 GENERAL

1.1 WORK INCLUDED

- A. Swimming pool equipment items required for this Work as indicated on the Drawings and specified herein.

1.2 QUALITY ASSURANCE

A. Qualifications of Workers:

1. The entity performing the work of this Section shall have been successfully engaged in the respective trade for at least five (5) years immediately prior to commencement of the Work.
2. For actual construction operations, use only trained and experienced workers with a minimum of three (3) years experience with the materials and methods specified.
3. Provide at least one person who shall be present at all times during execution of the work of this Section, with a minimum of five (5) years experience with the type of materials being installed, the referenced standards, and who shall direct all Work performed under this Section.

- B. All equipment supplied or work performed shall comply with regulations governing public swimming pools and spas as contained within the International Building Code, latest edition.

1.3 SUBMITTALS AND SUBSTITUTIONS

- A. Provide submittals in conformance with the requirements of Section 01 33 00.

B. Required submittals include:

1. Swimming Pool Fittings, Deck Equipment as specified in Article 2.1-2.2 of this Section.

- C. Submit proof of qualifications as specified in Article 1.2.A of this Section.

- D. The equipment shown on the plans represent the first listed items in the technical specifications. The Contractor shall be responsible for all required field coordination and installation of any approved equal product to provide a fully working and warranted system. The Contractor shall submit detailed shop drawings for any products used other than the first listed specified items. Contractor provided shop drawings shall include details and quality equal to the original plans and construction documents. The Contractor shall provide any and all required engineering including but not limited to structural and anchorage requirements for any proposed equipment other than the first listed specified equipment. The Contractor is responsible to provide a factory certified representative(s) to start-up and provide on-site training for all swimming pool mechanical equipment provided.

1.4 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect swimming pool equipment items before, during and after installation and to protect the installed work specified in other Sections.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Owner's Representative.

2. PART 2 – PRODUCTS

2.1 FITTINGS

- A. Main Drain Sumps, Frames & Grates: Remove and replace the existing pool main drain, frame and grate with 'Lawson Aquatics' #MLD-FG-1818 main drain frame and grate. Two (2) new required. The Contractor shall provide to the Owner a Certificate of Compliance, signed by a licensed design professional, for main drain sump(s) and frame(s) and grate(s), as required by the Virginia Graeme Baker Act.
- B. Floor Return Inlet 1-1/2" Adjustable: 'StaRite' #08417-0000, United Industries, or approved equal. Field verify. Replace top covers on all existing or complete floor inlet if damaged.
- C. Wall Return Inlets 1-1/2" Adjustable: 'StaRite' #08429-0000, United Industries, or approved equal. Field verify. Replace top covers on all existing or complete wall inlet if damaged.

2.2 DECK EQUIPMENT

- A. Handrails: KDI Paragon 3 bend, #342031.90" OD x .109" wall. Four (4) required.
- B. Stainless Steel Escutcheon Plates for Handrails: Spectrum model #35214, eight (8) required.
- C. Accessible Lift: Relocate existing PAL lift. Contractor shall provide new anchor.

2.3 MECHANICAL EQUIPMENT

- A. Contractor shall remove all associated wading pool mechanical equipment and cap off piping at penetration locations.

3. PART 3 EXECUTION

3.1 SURFACE CONDITIONS

- A. Inspection:
 - 1. Prior to installing the items of this Section, carefully inspect the installed Work of other trades and verify that all such Work is complete to the point where this installation may properly commence.
 - 2. Verify that the swimming pool equipment items may be installed in strict accordance with original design, pertinent codes and regulations, and the manufacturers' recommendations.
- B. Discrepancies:
 - 1. In the event of discrepancy, immediately notify the Owner's Representative.
 - 2. Do not proceed with installation in areas of discrepancy until all such discrepancies are fully resolved.
 - 3. Failure to notify the Owner's Representative and give written notice of discrepancies shall constitute acceptance by the Installer of existing conditions as fit and proper to receive its Work.

3.2 INSTALLATION

- A. Supply and install items of swimming pool equipment in strict accordance with applicable codes and regulations, the original design, and the manufacturer's published recommendations, anchoring firmly and securely for long life under hard use.
- B. Coordinate with other trades to insure all imbedded items are set plumb and flush. Railing ends must have anchor sockets and escutcheon plates. Be certain that deck equipment and railings are properly bonded prior to imbedding.

- C. All equipment shall be braced and/or anchored to resist a horizontal force acting in any direction using the criteria shown on the Drawings.

3.3 EQUIPMENT ACTIVATION

- A. All water chemistry and filtration mechanical equipment shall be operational upon filling of pool after plaster. Chemicals and other related support items as supplied by Contractor, shall be in supply at start-up.
- B. For the first seven (7) calendar days after completion of the pool plaster, brush all plastered surfaces at least twice a day and coordinate with General Contractor to ensure that the plaster is carefully maintained after the initial seven-day period. In addition, coordinate with the Contractor to ensure that pool filtration equipment is continuously running during the initial fourteen-day period.
- C. Start-up and provide qualified personnel to operate pool equipment for a period not less than seven (7) days after the pool is placed in operation, or until the Owner takes occupancy of the facility or letter of substantial completion. During this time, Contractor shall instruct and supervise the Owner's personnel in the various operating and maintenance techniques involved. Contractor shall be responsible for supply of chemicals during this not less than seven (7) day period and at time of turnover to Owner, chemical storage tanks shall be full. (Owner's personnel shall be fully trained and capable of assuming swimming pool maintenance tasks, training may begin before Owner takes occupancy).

3.4 CLEAN-UP

- A. Upon completion of swimming pool equipment, remove all debris, materials and equipment occasioned by this Work to the approval of the Owner's Representative.

END OF SECTION

SECTION 13 11 07

SWIMMING POOL MECHANICAL

1. PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Swimming pool mechanical piping as indicated on the Drawings for circulation and filtration systems, pool water heating systems, chemical control systems, booster pump systems and appurtenances.
- B. Domestic water system from points of connection within swimming pool mechanical equipment room to make-up water system.
- C. Filter backwash piping to point of connection with backwash retention pit as required.

1.2 QUALITY ASSURANCE

A. Qualifications of Workers:

- 1. The entity performing the work of this Section shall have been successfully engaged in the respective trade for at least five (5) years immediately prior to commencement of the Work.
- 2. For actual construction operations, use only trained and experienced workers with a minimum of three (3) years experience with the materials and methods specified.
- 3. Provide at least one person who shall be present at all times during execution of the work of this Section, with a minimum of five (5) years experience with the type of materials being installed, the referenced standards, and who shall direct all Work performed under this Section.

B. Standards:

- 1. All equipment supplied or work performed shall comply with Chapter 31B of California Building Code, latest edition.
- 2. Work shall be performed in accordance with the applicable editions of all National, State and local codes, laws, regulations and ordinances, including the following:
 - a. American National Standards Institute (ANSI).
 - b. American Society for Testing Materials (ASTM).
 - c. American Waterworks Association (AWWA).
 - d. American Welding Society (AWS).
- 3. Do not construe anything in the Drawings or Specifications to permit Work not conforming to these requirements.

1.3 SUBMITTALS AND SUBSTITUTIONS

- A. Provide submittals in conformance with the requirements of Section 01 33 00.
- B. Required submittals include:
 - 1. Pipe and Fittings as specified in Article 2.2 of this Section.
 - 2. Valves as specified in Article 2.3 of this Section.

3. Pressure / Vacuum Gauges as specified in Article 2.4 of this Section.
 4. Pipe Hangers and Supports as specified in Article 2.5 of this Section.
 5. Sleeves and Waterstops as specified in Article 2.6 of this Section.
- C. Submit proof of qualifications as specified in Article 1.2.A of this Section.

1.4 PRODUCT HANDLING

- A. Delivery: Deliver all materials to the Project Site in the manufacturer's original unopened containers with all labels intact and legible.
- B. Storage: Store all materials under cover in a manner to prevent damage and contamination, and store only the specified materials at the Project site.
- C. Protection: Use all means necessary to protect swimming pool mechanical items before, during and after installation and to protect the installed Work specified in other Sections.
- D. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Owner's Representative and at no additional cost to the Owner.

1.5 JOB CONDITIONS

- A. Cooperate with entities performing Work specified in other Sections to so that no conflict of new construction or occupied space may occur. Should any installation Work be done without such craft coordination, that Work so installed shall be removed and re-installed.

2. PART 2 - PRODUCTS

2.1 PRODUCT QUALITY

- A. Materials and equipment shall be new, of the best quality for the purpose intended, and shall be clearly marked with the manufacturer's name and nameplate data or stamp and rating. As far as practicable, materials and equipment shall be of one manufacturer.

2.2 PIPE AND FITTINGS

- A. PVC Schedule 40: Type 1, normal impact, NSF approved for solvent welding applications, ASTM Specification D-1785, color shall be white. Dura, Lasco, or approved equal.
- B. PVC Schedule 80: Type 1, normal impact, NSF approved for solvent welding applications, ASTM Specification D-1785, color shall be gray. Dura, Lasco, or approved equal.
- C. CPVC Schedule 80 Influent/Effluent Piping: Type 1, normal impact, NSF approved for solvent welding applications, ASTM Specification D-1785, color shall be gray. Dura, Lasco, or approved equal.
- D. PVC DR25: Conforming to ASTM D-1784, use with epoxy coated bell and spigot-type fittings or epoxy coated mechanical joint by flange adapters with epoxy coated cast iron fittings as specified in Article 2.02 (F), below. Johns-Manville "Big Blue", Diamond Plastics, or approved equal.
- E. Copper Tubing: ASTM Specification B-88, hard drawn, with ANSI Standard B16.22 wrought copper fittings.
- F. Steel: ASTM Specification A-120, Schedule 40 black or galvanized pipe with ASTM A-47 150 lb. banded malleable iron threaded fittings.
- G. Cast Iron: ASTM Specification B16.1, cast iron flanged fittings, provide epoxy coating as required for use with chlorinated water.

2.3 VALVES

A. Ball Valves:

1. For pool system: True-Union design, PTFE seat material with FPM or FKM Double O-ring stem seals, locking handle, NSF certified. PVC schedule 80 body for below grade installation. CPVC Schedule 80 body for above grade installation. Furnish ball valves on all pipe diameters 2½" or less with a rating of at least 200psi at 73°F. Asahi, Ipex, or Nibco.
2. For copper pipe system: 3-piece full-port Bronze body valve with Teflon seat, 'Apollo', 'Nibco' or approved equal.

B. Butterfly Valves:

1. Epoxy coated cast or ductile iron body, 316 stainless steel disc and stem, viton seat material, furnish hand wheel/gear operators on all valves 8" and larger. DeZurick, Keystone, Ipex or equal.
2. PVC body, PVC disc and EPDM construction suitable for chlorinated water applications. Stem shall be of 316 stainless steel and non-wetted. Valves shall be self-gasketed design with a convex sealing arrangement. Valves 1-1/2" – 10" shall be rated to 150 psi and 12" valves shall be rated to 100 psi at 70°F. Asahi Pool-Pro, no known equal.

C. Check Valves: Wafer-type, epoxy coated cast or ductile iron body, 316 stainless steel plates and shaft, viton seat material. Centerline, Metraflex, or approved equal.

D. Surge Chamber Float Valve: EPD #2-0020-230 Float Control Valve, 10" line size, as manufactured by Environmental Products Division of Doughboy Recreational, Rancho Cucamonga, CA, no known equal.

E. Surge Chamber Isolation Valve: Butterfly valve, tapped lug style, bronze body, stainless steel stem, bronze disc, phenolic back-up ring, EPT seat material. Provide stainless steel shaft extension, shaft housing and tool operator located 2'-0" above floor level with deck access grate as required. DeZurick, Keystone, Asahi, Spears, or Ipex or approved equal.

F. RP Backflow Preventer: Febco #835-B for 2" and smaller; #825 for 2-1/2" and larger. Febco, Watts, or approved equal.

G. Make-up Water Control: 3" 'Cla-Val' fill system to include 3" 'Cla-Val' solenoid control valve #136-01BY, 3" ductile iron, epoxy coated body with cast iron disc retainer and diaphragm washer, bronze trim, flanged globe pattern, 120V at 60 Hz. Solenoid wiring shall be wired to water chemistry controller. Provide 6" air gap at fill point.

2.4 PRESSURE / VACUUM GAUGES

- A. Furnish and install pressure and vacuum gauges on the discharge and suction sides of all pumps. 2" or 2 ½" dial, bottom connection, chrome ring, shut-off cock and snubber. Ranges shall be selected to indicate between mid-point and two-thirds of maximum range under design conditions. Marsh, Terrice, or approved equal.

2.5 PIPE HANGERS AND SUPPORTS

A. General:

1. The requirements of this Section relates to various requirements of the Agreement, General and Supplementary Conditions, Specifications, Drawings, and modifying documents which are part of the Construction Contract. Responsibility for coordination of all such applicable requirements will be that of the Contractor.

B. Description:

1. This section provides direction for the support and seismic bracing of all mechanical, plumbing and electrical items to the building structure.
2. Installation of all support and bracing systems as required for the swimming pool systems as detailed on the drawings.

C. Quality Assurance:

1. Design and install all support systems to comply with the requirements of the 2016 California Building Code, Chapter 16.

D. Submittals:

1. Submit shop drawings for all substructures and attachment methods.
2. Submit proposed alternative methods of attachment for review and approval by the Architect and SEOR prior to deviating from the requirements shown on the drawings.

E. Materials:

1. Use Kin-Line, Grinnel, or approved equal.
2. Support all pipelines individually with hangers, each branch having at least one hanger. Lateral brace as noted and required.
3. Support piping near floor with steel stanchions welded to end plates secured to pipe and floor.
4. Support vertical piping at each floor level. Install coupling in piping at each support. Coupling shall rest on and transmit load to support. Isolate copper from steel supports with vinyl electrician's tape around pipe and coupling.
5. Use Stoneman "Trisolator," Unistrut, or approved equal, isolators at each hanger and other support points on bare copper tubing system.
6. For PVC pipe, space hangers four (4) feet apart for pipe sizes 1" and under, five (5) feet apart for pipe sizes 1-1/4" to 2", and six (6) feet apart for pipe sizes over 2". Space hangers for horizontal pipes at a maximum of six (6) feet for copper 2" and smaller and for steel 1-1/4" and smaller; ten (10) feet for copper 2-1/2" and larger and for steel 1-1/2" and larger.
7. Size hanger rods, screws, bolts, nuts, etc., according to manufacturer's sizing charts.
8. Trapeze hangers may be used for parallel lines.
9. Use galvanized or cadmium plated hangers, attachments, rods, nuts, bolts, and other accessories in pool mechanical room, high humidity areas, or where exposed to weather. Hot dip galvanize all items which are not factory furnished. Plating for hinged movements must be done at the factory.
10. Lateral Bracing: To prevent swaying of the piping systems, provide angle iron bracing and anchor into wall or overhead framing. Piping shall be braced or anchored in such a way as to resist a horizontal force of 50% of its operating weight in any direction.
11. Do not use wire or other makeshift devices for hangers.
12. Furnish all substructures and fasteners required to comply with the limitations given below. Use material as specified in the various sections and as appropriate to their use.

F. Guidelines & Limitations:

1. Each Contractor will coordinate the load requirements from all subcontractors so that no combination of loads overstresses the building structure or exceed the limitations given below.
2. Concrete Structure:
 - a. Support all loads hung from concrete structure with cast-in-place inserts, unless drilled-in anchors are specifically approved in writing prior to placing the concrete.
 - b. Concrete anchors must not penetrate into reinforcing bars. Where the anchors boring indicates the presence of reinforcing bar, patch hole with an epoxy type grout and relocate anchor 12 diameters away.
 - c. Individual expansion anchors cannot support any loads greater than 300 pounds or manufacturer's specified load capacity without approval.
3. Steel Structure:
 - a. Hang no more than 20 pounds per metal deck rib in any span.
 - b. At beams, hang all beam loads greater than 40 pounds concentric to beam, not off the flanges.
 - c. Attached no loads to the beams or girders greater than the following without specific approval from the architect;
 - 1) Roof beams and girders: 300 pound point load or 600 pound total load for a single span.

G. Seismic Bracing:

1. Design and install seismic bracing to not ground out vibration and sound isolation systems.
2. All items of mechanical and electrical equipment 60" or more in height are to be seismically braced whether such bracing is shown or not.

2.6 SLEEVES AND WATERSTOPS

- A. Provide sleeves where work of this Section passes through fire rated partitions, floors and ceilings, concrete slabs or exterior of structure. Caulk clearance space using sealant appropriate for application in conformance with manufacturer's recommendations and Title 24 of California Code of Regulations. 3m, Dow Corning, or approved equal. In lieu of sleeves and caulking, "Link Seal" products may be used.
- B. Provide prefabricated waterstops as indicated on the Drawings at all pipe penetrations through structures containing stored water (i.e., swimming pools, balance/surge tanks, etc.) to insure leak-proof seals.

3. PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Inspection:

1. Prior to Work of this Section, carefully inspect the installed Work of other trades and verify that such work is complete to the point where this installation may properly commence.
2. Verify that items of this Section may be installed in accordance with the original design and referenced standards.

B. Discrepancies:

1. In the event of discrepancy, immediately notify the Owner's Representative.
2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.
3. Failure to notify the Owner's Representative and give written notice of discrepancies shall constitute acceptance by the Contractor of existing conditions as fit and proper to receive his work.

3.2 ABBREVIATIONS AND SYMBOLS

- A. Abbreviations and symbols on the Drawings are those most commonly used. Obtain clarification from the Owner's Representative on any questionable items before bid.

3.3 GENERAL PIPING REQUIREMENTS

- A. Size any section of pipe for which size is not indicated or any intermediate section erroneously shown undersized the same size as the largest pipe connecting to it. Sizes listed are nominal.
- B. Cut pipe accurately to job measurements and install without springing or forcing, true to line and grade, generally square with building and/or structures and adequately supported to prevent undue stress on pipe, fittings and accessories.
- C. Make changes of direction with manufactured fittings. Street ells, bushings, reducing flanges, close nipples or bending of pipe is not allowed.
- D. Use great care to install piping in accordance with best practice. Plastic pipe shall be "snaked" in trenches to allow for thermal expansion.
- E. All above grade, below grade and buried or imbedded PVC shall be installed using solvent weld fittings. Also, each and every fitting and pipe end shall be prepared with solvent primer. Fittings shall be joined individually and with enough time between assembly of adjacent joints to allow them to seal solidly. After joining, an even ring of primer must be visible around the entire fitting. If any fittings are installed without visible primer, the fitting shall be removed and discarded and piping recut, rechamfered and joint made up again using a new fitting. All procedures, methods and techniques used to make up solvent weld joints shall be in strict accordance with manufacturer's recommendations.
- F. Arrange pipe and hangers to allow for expansion, contraction and structural settlement. No pipe shall contact structure except penetrations as shown on the Drawings.
- G. Provide dielectric connections between copper and dissimilar metals. In copper systems, threaded piping including connections to equipment shall be brass pipe and fittings. Install dielectric connections in vertical sections of piping only.
- H. Run pipe full size through shut-off valves, balancing valves, etc. Change pipe size within three (3) pipe diameters of final connection to control valves, fixtures and other equipment.
- I. Provide unions or flanges at connections to equipment, on service side of valves and elsewhere as required to facilitate ease of maintenance.
- J. Locate equipment shut-off valves as close to equipment as possible maintaining easy valve access.
- K. Make all connections between domestic water systems and equipment or face piping with approved backflow prevention devices as required.

- L. All PVC pipe exposed to direct sunlight shall be painted with two coats of Exterior Acrylic Semi-gloss Paint, Sherwin Williams or equal. Color to be selected by the Architect. Prior to painting the PVC pipes, the exterior of all PVC pipes shall be wiped with Methyl Ethyl Ketone, or an approved equal, to remove the glaze from the pipes.
- M. The Main Drain pipe must run either level or uphill from the main drain sump, through the surge pit (if applicable) and then to the circulation pump.

3.4 TRENCH EXCAVATION AND BACKFILL

A. Excavation:

1. Excavate and backfill trenches as required for the Work of this Section. Conform to requirements of Section 13 11 01.
2. The Contractor shall perform all excavation of every description and of whatever materials encountered, to the depths indicated on the Drawings or as necessary. The Contractor shall dispose of the excavated materials not required or suitable for backfill as directed, and shall perform such grading as may be necessary to prevent surface water from flowing into the trenches. The Contractor shall provide adequate equipment for the removal of storm or subsurface waters, which may accumulate in the excavated areas.

B. Trenching:

1. Excavate trenches to lines and grades as indicated on the Drawings and with banks as nearly vertical as practicable.
2. Bottoms of trenches shall be accurately graded to provide uniform bearing on undisturbed soil for the entire length of each section of pipe.
3. The width of the trench at and below the top of the pipe shall be such that the clear space between the barrel of the pipe and the trench wall shall not exceed 8" on either side of the pipe. The width of trench above the top of pipe may be wider if necessary.
4. Over-depth excavations shall be filled with tamped sand to required grades.
5. Excavations of five (5) feet or more in depth shall be shored or supported in conformance with rules, and regulations of State and Federal Governments. Shoring shall be constructed, maintained and removed in a manner to prevent caving of the excavation walls or other load on the pipe.

C. Backfilling:

1. Material for backfilling of pipes shall be approved granular material less than two (2) inches in diameter obtained from the excavation. No material of a perishable, spongy or otherwise unsuitable nature shall be used as backfill.
2. Backfilling of pipe trenches shall commence immediately after installation and testing to preclude damage to the installed pipe. Backfill around pipe shall be carefully placed so as not to displace or damage the pipe, and shall be carried up symmetrically on each side of the pipe to one foot above the top of the pipe. The material shall be carefully compacted or consolidated before additional backfill is placed.
3. Backfill above an elevation of one foot above the top of pipe in conformance with requirements of Section 13 11 01. Material for balance of backfill shall be approved granular material less than six (6) inches in diameter taken from the excavation.
4. Unless otherwise indicated on the Drawings, all pipe shall have a minimum of eighteen (18) inches of cover.

3.5 GENERAL EQUIPMENT REQUIREMENTS

- A. Position equipment to result in good appearance and easy access to all components for maintenance and repairs.
- B. Install piping, flues, breeching and ducts so that they do not interfere with equipment access.
- C. Install level, secure and out of moisture. Provide shims, anchors, support straps, angles, grouted bases, or other items as required to accomplish proper installation.
- D. All screws, nuts, bolts and washers shall be galvanized, cadmium plated or stainless steel. After fabrication, hot-dip galvanize unfinished ferrous items for outdoor, below grade or other use subject to moisture.
- E. Extend 1/2" Schedule 40 black steel pipe lubrication tubes from all hard to reach locations to front of equipment or to access points. Terminate with proper type of lubrication fitting.

3.6 VALVES AND STRAINERS

- A. If no shut-off is indicated, provide ball valves at inlet connections and balance valves at outlet connections to fixtures and equipment. Provide proper valve trim for service intended.
- B. Use no solder end valves unless noted otherwise; provide adapters in copper tubing systems.
- C. Locate valves with stems above horizontal plane of pipe. In general, locate valves within six (6) feet of floor, out from under equipment, in accessible locations with adequate clearance around hand wheels or levers for easy operation.
- D. Provide all valves, cocks and strainers, full pipe size unless indicated otherwise.
- E. Provide hand wheel operators on all valves 6" and larger, under 6" lever operators may be used.
- F. Provide tool operated valve with stainless steel shaft extension and 'on deck' tool operation for surge chamber butterfly isolation valve.

3.7 IDENTIFICATION OF PIPING

- A. Identify each valve by a numbered brass tag with hole and brass chain mounted on valve stem or handle. Tag to be a minimum of 1" in diameter and numbers at least 1/4" high stamped into tag. Valves and plumbing lines shall be labeled clearly with the source or destination descriptions.
- B. Install an identification chart in a plastic or glass framed enclosure, which schematically illustrates the proper operation of all piping systems and indicates number and location of all valves and control devices within the system.
- C. The direction of flow for the recirculation equipment shall be labeled clearly with directional symbols such as arrows on all piping in the equipment area. Where the recirculation equipment for more than one pool is located on site, the equipment shall be marked as to which pool the equipment serves.

3.8 TESTS

- A. Perform tests in presence of Owner's Representative with no pressure loss or noticeable leaks.
- B. Do not include valves and equipment in tests. Include connection to previously tested sections if systems are tested in sections.

C. Perform tests as follows:

System	Test Pressure	Test Medium	Duration
Skimmer Lines and Lawson Main Drain sump lines	20psig	Water*	4 hours
Pool Piping	50 psig	Water*	4 hours
Pool Main Drains	30 psig	Water*	4 hours
Domestic Water	150 psig	Water*	4 hours

*Never test PVC pipe or fittings with air or other gases, always use water.

3.9 PIPE MATERIAL APPLICATION

- A. PVC Schedule 40: Below grade swimming pool piping and domestic water piping up to 12" line size; use standard solvent weld fittings.
- B. PVC Schedule 80: Above grade swimming pool piping up to 12" line size; use solvent weld Schedule 80 or epoxy coated cast iron fittings.
- C. Type L Hard Copper: Above grade domestic water piping.
- D. CPVC Schedule 80; Pool Heater Piping.
- E. Schedule 40 Steel: Natural gas piping.

3.10 CUTTING AND DRILLING

- A. Cutting or drilling necessary for installation of Work of this Section shall be done only with approval of Owner's Representative.

3.11 CLOSING-IN OF UNINSPECTED WORK

- A. Do not cover or enclose Work before testing and inspection. Re-open Work prematurely closed and restore all Work damaged.

3.12 QUIETNESS

- A. Quietness is a requirement. Eliminate noise, other than that caused by specified equipment operating at optimum conditions, as directed by Owner's Representative.

3.13 FLUSHING OF LINES

- A. Flush or blow out pipes free from foreign substances before installing valves, stops or making final connections. Clean piping systems of dirt and dust prior to initial start-up.
- B. Just prior to plastering the pool, under the observations of the IOR, the pool mechanical system shall be flushed using the pool circulation pump. Circulate water through the mechanical system until the effluent water from the pool return heads runs clean.

3.14 CLEAN-UP

- A. After all Work has been tested and approved, the Swimming Pool Subcontractor shall thoroughly clean all parts of the equipment installations, including all pool pipe and fittings in the pool mechanical room. Exposed parts shall be cleaned of cement, plaster and other materials and all grease and oil spots removed with solvent.

- B. The Swimming Pool Subcontractor shall remove debris from the Project site. Cartons, boxes, packing crates and excess materials not used, occasioned by this work shall be disposed of to the satisfaction of the Owner's Representative.
- C. If the above requirements of clean up are not performed to the satisfaction of the Owner's Representative, the Owner reserves the right to order the work done, the cost of which shall be borne by the Swimming Pool Subcontractor.

END OF SECTION

SECTION 13 11 08

SWIMMING POOL ELECTRICAL

1. PART 1 GENERAL

1.1 WORK INCLUDED

- A. Provide labor, materials and equipment as required to install the swimming pool electrical system including but not limited to:
 - 1. A complete and operable system of service equipment, switchboards, panelboards, conduits, switches, time clocks and wiring for power and lighting, motor control centers.
 - 2. Junction and/or pull boxes, conduits, disconnects, starters, contactors, wiring and connection of all motors and mechanical equipment, including connection and wiring of line voltage controls associated with the mechanical systems.
 - 3. Swimming pool underwater lighting systems.
 - 4. Swimming pool timing system outlets and scoreboard.
 - 5. Complete grounding system as required and shown on the Drawings.
 - 6. Complete equipotential bonding system as required and shown on the Drawings.
 - 7. Adjusting and preliminary operation of the completed electrical system as described in Article 3.06, A of this Section.
 - 8. Cleaning of all completed Work and installation adjustment of all trim and decorative items.

1.2 QUALITY ASSURANCE

- A. Qualifications of Workers:
 - 1. The entity performing the work of this Section shall have been successfully engaged in the respective trade for at least five (5) years immediately prior to commencement of the Work.
 - 2. For actual construction operations, use only trained and experienced workers with a minimum of three (3) years experience with the materials and methods specified.
 - 3. Provide at least one person who shall be present at all times during execution of the work of this Section, with a minimum of five (5) years experience with the type of materials being installed, the referenced standards, and who shall direct all Work performed under this Section.
- B. Ordinances and Codes: Materials and construction shall conform with all applicable code requirements, including:
 - 1. California Electrical Code, latest edition; Electrical Safety Orders of the State of California; Department of Industrial Relations; regulations of the State Fire Marshal; rules and regulations of the Board of Underwriters of the Pacific, UL 50, 50E and NEMA 250 rating.
 - 2. Chapter 31 of California Building Code, latest edition.

C. Verification of Conditions:

1. The locations shown on the Drawings are diagrammatic only and the exact finish location of equipment and materials cannot be indicated. Therefore, locations of all Work and equipment shall be verified to avoid interferences, preserve head room and keep openings and passageways clear. Changes shall be made in locations of equipment and materials which may be necessary to accomplish these purposes.

D. Preliminary Operations and Testing:

1. Motor driven equipment shall be tested for correct rotation and completion of all connections.

1.3 SUBMITTALS AND SUBSTITUTIONS

A. Provide submittals in conformance with the requirements of Section 01 33 00.

B. Required submittals include:

1. Conduit and Fittings as specified in Article 2.2 of this Section.
2. Panelboards as specified in Article 2.6 of this Section.
3. Circuit Breakers as specified in Article 2.7 of this Section.
4. Motor Starters as specified in Article 2.10 and 2.11 of this Section.
5. Fuses as specified in Article 2.13 of this Section.
6. Time Clocks as specified in Article 2.14 of this Section.
7. Ground Fault Circuit Interrupters as specified in Article 2.15 of this Section.
8. NEC required corrosion resistant enclosures, cabinets and boxes as specified in Article 2.08, 2.11, 2.16 & 218 of this Section.

C. Submit proof of qualifications as specified in Article 1.2.A of this Section.

1.4 PRODUCT HANDLING

- A. Delivery: Deliver all materials to the Project Site in the manufacturer's original unopened containers with all labels intact and legible.
- B. Storage: Store all materials under cover in a manner to prevent damage and contamination, and store only the specified materials at the Project site.
- C. Protection: Use all means necessary to protect swimming pool electrical materials before, during, and after installation and to protect the installed Work specified in other Sections.

2. PART 2 PRODUCTS

2.1 MATERIALS, GENERAL

- A. Materials shall be new, in unbroken packages and bear the U.L. label of approval.

- B. Equipment of one type shall be by same manufacturer. One type of equipment for classifications such as:
1. Switchboards, panels, buss duct, disconnect switches and allied items.
 2. Conduit.
 3. Wire.
 4. Conduit fittings.
 5. Fixtures of the same general type.
 6. Wiring devices.

2.2 CONDUIT AND FITTINGS

- A. Conduit within or under buildings or where exposed outdoors shall be rigid metal threaded, hot dipped, galvanized, or U.L. approved plastic except where noted otherwise on the Drawings. Metallic conduit shall be of the same metal between outlets or terminals.
- B. Use flexible metallic conduit only for short connections of motors and where specifically called for on Drawings. Maximum length shall be 40". Use only liquid tight flexible metal conduit. Install an unbroken #12 AWG insulated copper grounding conductor in each liquid tight flexible conduit with permanent connection at motor junction box and service panel ground.
- C. Protect, before installation, metallic conduit runs in all slabs laid on grade or in contact with the earth or exposed in damp locations, with two (2) heavy coats of asphaltum rust-resisting compound.
- D. Encase conduits 2-1/2" or larger run underground, outside, or under buildings, in concrete envelopes a minimum of 3" thick, except as indicated otherwise on Drawings or stubouts. Conduits 2 and smaller laid 18" below finish surface in soil.
- E. Low voltage runs underground outside buildings, 1-1/4" or smaller, may be G.I. or sherardized steel conduit, with machine applied wrapping equal to double wrap or Scotch-Wrap #50 tape, half lapped and quadrupled at joints in lieu of concrete encasement.
- F. Service conduits through foundations or concrete members shall run through metal sleeves with adequate clearances for full movement of the conduit. Do not run conduits through footings.
- G. Secure conduits run exposed on surfaces with one-hole heavy-duty straps or fasten with matching fittings to inserts or trapezes, parallel to building walls and ceilings.
- H. Cap all conduit or duct stub-outs with standard factory caps; except cap threaded steel conduit with B.I. water pipe caps in outdoor locations.
- I. Use conduit fittings as manufactured by Crouse-Hinds Company, Appleton Electric Co., or approved equal.
- J. Employ U.L. liquid tight fittings for use with liquid tight flexible metal conduit.
- K. Use unions as manufactured by Appleton, O-Z/Gedney, or approved equal. The use of running threads will not be permitted.
- L. Exposed conduit and fittings in chemical rooms shall be nonmetallic rigid polyvinyl chloride, corrosion resistant rated suitable for installation in corrosive environments and in accordance with the latest NEC requirements.

2.3 EQUIPOTENTIAL BONDING / GROUNDING

- A. Bond together and ground to a common ground at a single point all metallic conduit, piping systems, pool reinforcing steel, metal parts of ladders, lifeguard stands, handrails and their supports and the like. The solid copper bonding conductor shall not be smaller than #8 copper.

2.4 WIRING CONNECTIONS

- A. Make connections without strain on conductors, allowing the conductors to take a natural position after connections or taps are made. Include all strand of wire in making the connection.
- B. Make connections for wiring by one of the following means:
 - 1. Make all taps or connections to conductors with compression type connectors except those smaller than #8 B&S gauge may have soldered connections. Solderless connections for #10 AWG or smaller may be used and shall be "Scotchlok", Buchanan, or approved equal. For #8 AWG or larger, they shall be T&B "LockTite", Burndy "Versitaps", or approved equal.
 - 2. All cable or conductor terminal lugs shall be Burndy "Quicklug", IlSCO, or approved equal. Two piece stamped lugs and solder lugs will not be approved.
 - 3. Paint taped splices in damp or outdoor locations with two (2) coats of insulating paint.
 - 4. Tag all branch circuit wires with circuit number at the panelboard and at each point of use with linen or plastic tags.

2.5 CONDUCTORS

- A. Copper RHW or THW. Do not make splices between boxes.

2.6 COLOR CODING

- A. Neutrals (identified conductors shall be white).
- B. Phase conductors shall be red for phase B; blue for phase C.
- C. Green shall be used for mechanical equipment and receptacle grounds only.

2.7 MOTOR WIRING

- A. Make final connections to motors with the required AWG (Minimum #12), Flamenol machine tool wire, 19 strand. Control wiring for equipment shall be Flamenol machine tool wire, 19 strand of required AWG. Provide corrosion resistant junction boxes at each item of equipment to change from standard building wiring to machine tool wire.
- B. Phase motors as proper in direction of rotation.

2.8 PANELBOARDS

- A. Panelboards shall be flush or surface mounting as indicated with circuit breakers as shown on panel schedule, hinged lockable doors, index card holders and proper bussing.
- B. Where indicated on the drawings, panelboards shall be furnished with subfeed breakers and/or lugs, split bussing, contractors, time switches, relays, etc., as required.
- C. All panelboards shall be keyed alike.

- D. All panelboard enclosures shall be corrosion resistant rated in accordance with the latest NEC requirements.
- E. Furnish corrosion resistant panelboard enclosures and terminal cabinets with Yale 46515 flush locks and LL806 keys except where indicated otherwise herein. Fasten the trim to panel boards and terminal cabinet by means of concealed, bolted or screwed fasteners accessible only when the door is open.
- F. Panelboards 208/120 volt, three phase, 4 wire, S/N or 120/240 volt, single phase, 3 wire, S/N.

Panelboard types as manufactured by:

Westinghouse	Type B10B
General Electric	Type NLAB
Square D	Type NQOB

- G. Panelboards for 480/277 volt, three panes, 4 wire, S/N.

Panelboard types as manufactured by:

Westinghouse	Type Pow-R-Line 2
General Electric	Type AE
Square D	Type NEHB
Sylvania	Type NH1B
I.T.E.	Type Approved Equal

- H. Panelboard for bussing sizes thru 400 amp shall be 20" wide surface mounted type. Recess mounted type shall have a 20" wide (maximum) recess metal enclosure with trim plate cover extending 1" on all sides of enclosure. Depth shall be 5-3/4" nominal. Height of panel as required for devices.
- I. Provide 6" additional gutter space in all panels where double lugs are required, or where cable size exceeds bus size. Minimum bottom gutter space shall be 6" high. 12" additional gutter space may be required for aluminum feeders where used.
- J. Panelboards shown on the drawings with relays, time clocks or other control devices shall have a separate metal barriered compartment mounted above panel with separate hinged locking door to match panelboard. Provide mounting sub-base in cabinet for control devices and wiring terminal strips.
- K. Panelboard shall have a circuit index card holder removable type, with clear plastic cover. Index card shall have numbers imprinted to match circuit breaker numbers.

2.9 CIRCUIT BREAKERS

- A. Breakers shall have a minimum short circuit interrupting rating of 10,000A symmetrical for panelboard voltage thru 240 volt and 14000A for panelboards thru 600 volts or as specified on the drawings. In no case shall the interrupting rating be less than the bus withstand rating unless noted otherwise on the drawings.
- B. Circuit breakers as manufactured by the following companies only are acceptable:
 1. General Electric Company
 2. Square D Company
 3. Westinghouse Company
 4. I.T.E. Company
- C. Circuit breakers shall be arranged in the panels so that the breakers of the proper trip settings and numbers correspond to the numbering in the panel schedules on the drawings. Circuit numbers of breakers shall be black-on-white micarta tabs or other previously approved method. Circuit number tabs which can readily be changed from front of panel will not be accepted. Circuit number tabs shall not be attached to or be a part of the breaker.

- D. Where two or three pole breakers occur in the panels, they shall be common trip units. Single pole breakers with tie-bar between handles will not be accepted.
- E. All circuit breakers shall be padlockable in the "off" position. Locking facilities shall be riveted or mechanically attached to the circuit breaker (submit sample for approval). Other means of attachment shall not be accepted without prior written approval of Architect.
- F. Where branch circuit breakers supply the power to motors and signal systems, the breakers shall be furnished with lockout clips, mounted in the "on" position. The breakers shall be able to trip automatically with lockout clips in place.
- G. Panelboard circuit breakers shall be bolt-on type.

2.10 BUSSING

- A. Bussing shall be rectangular cross section copper, or full length silver or tin-plated aluminum.
- B. Bussing shall be braces to withstand symmetrical short circuit ratings as follows or as noted on drawings. In no case shall bus short circuit bracing be less than specified circuit breakers.
- C. Each panelboard 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.

2.11 POOL MECHANICAL EQUIPMENT ENCLOSURES, TERMINAL CABINETS, AND MISC. CABINETS

- A. All pool mechanical equipment enclosures, terminal cabinets and miscellaneous cabinets in the pool mechanical room or chemical storage rooms shall be corrosion resistant rated in accordance with the latest NEC requirements. Enclosures and all cabinets shall be flush mounted (except where noted a surface) of the size indicated on the drawings, and complete with hinged lockable doors and the number of 2-way screw terminals required for termination of all conductors. Terminal cabinet locks to operated form same key used for panelboards. The trim to terminal cabinets shall be fastened by means of concealed bolted or screwed fasteners accessible behind door to terminal cabinets. Terminal cabinets shall have 5/8" plywood backing.
- B. Provide engraved nameplate on each enclosure and cabinet indicating its designation and system (i.e., Swimming Pool - Panel 'SP').

2.12 MOTOR CONTROL INDIVIDUAL STARTERS

- A. Manual Motor Starters:
 1. Provide flush or surface mounting manual motor starters with number of poles and size of thermal overload heaters as required for the motor being controlled (equipped with overload heaters, one for each motor lead). Back boxes shall be supplied with all flush mounting starters whether they are toggle type requiring only a 4" square outlet box or the larger type requiring a special box and cover designed to accept the particular unit. All box types shall be corrosion resistant rated in accordance with the latest NEC requirements.
 2. Unless otherwise noted on the drawings, all manual starters for single phase motors, smaller than 1 h.p., shall be the compact toggle type. Manual starters for all single-phase motors, 1 to 5 h.p., and all three phase motors up to 5 h.p. shall be the heavy duty type.
 3. Where manual motor starter is shown with pilot light, the pilot light shall be installed in a separate outlet box adjacent to the starter outlet, and engraved nameplate in indicate function of pilot light.

4. The following motor starters as manufactured by:

Manufacturer	Single Phase 1HP and Below	Others
Arrow Hart	Type RL	Type LL
General Electric	CR 101	Class CR 1062
I.T.E.	Class C10, C11 or C12	Class C20
Square D Company	Class 2510, Type A	Class 2510, Type B & C
Westinghouse	Type MS	Type A100
Allen Bradley	Approved Equal	Approved Equal.

B. Individual Magnetic Motor Starters:

- Magnetic motor starters shall be A.C. line voltage, across-the-line units in a corrosion resistant rated enclosure in accordance with the latest NEC requirements.
- All starters located outside of a building whether or not indicated shall be W.P. (weatherproof), and all starters noted W.P. shall be furnished in a corrosion resistant rated stainless steel enclosure in accordance with the latest NEC requirements.
- Starter shall be horsepower rated for the motor controlled, and shall be equipped with properly sized overload elements. Every pole shall be with overload element.
- Verify the exact motor current and voltage characteristics with the Contractor supplying the motor before installation of a starter.
- Each starter shall be equipped with "Hand-Off-Auto" switch or stop-start pushbutton as required.
- Coils shall be designed to operate on voltage indicated on control diagrams and have built-in-under the voltage release for coil circuit to drop motor starter off the line when the line voltage drops below normal operating voltage.
- The coil control circuit shall be independently fused, sized to protect coil.
- Starters to be equipped with running pilot light indication with a "Push-to-Test" feature.
- Magnetic starters shall have a minimum of two auxiliary contacts. Additional auxiliary contacts shall be provided as required to comply with the requirements of the wiring diagrams on the electrical and mechanical drawings and the description of the function in the Mechanical Section of the Specifications.
- Minimum starter size shall be NEMA size I unless indicated otherwise.
- The following types of magnetic motor starters as manufactured by:

Manufacturer	Type
General Electric	Class CR 106
I.T.E.	Class A20
Square D Company	Class 8536
Westinghouse	Type A200 (Size 4 Max.) or Class II-200 (Sizes 5-8)

2.13 INDIVIDUAL COMBINATION MOTOR STARTERS

- Combination starter shall incorporate fused disconnect switch and individual magnetic motor starter. Combination starters shall be mounted in a corrosion resistant rated enclosure in accordance with the latest NEC requirements.
- Starters shall comply with NEMA standards, size and horsepower ratings as indicated on drawings General Electric, Square D, Westinghouse or I.T.E.

- C. The disconnect handle used on combination starters shall control the disconnect device with the door opened or closed. The disconnect handle shall be clearly marked as to whether the disconnect device is "ON" or "OFF", and shall include a two-color handle grip, the black side visible in the "OFF" position indicating a safe condition, and the red side visible in the "ON" position indicating an unsafe or danger condition.
- D. All starters used in combination starters shall be manufactured in accordance with the latest published NEMA standards, sizes, and horsepower ratings. These starters shall be furnished with three melting alloy type thermal overload relays.
- E. Thermal units shall be of one-piece construction and interchangeable. The starter shall be inoperative if a thermal unit is removed.

2.14 MOTOR CONTROL CENTER, INTERLOCKS AND CONTROL DEVICES

- A. Refer to mechanical and plumbing drawings and specifications and provide all control devices including timeswitches, relays and interconnection of starters of required.
- B. Mount all relays and timeswitches in a separate compartment in motor control center unless otherwise indicated.
- C. Whether shown on mechanical and plumbing drawings or control center schedules or not, where motors are controlled by external devices (i.e., thermostats, relays, float or pressure switches, etc.) or interlocked with other motors, each motor starter to be equipped with a "Hand-Off-Auto" selector switch in starter cover. Other starters equipped with a "Start/Stop" pushbutton station in starter cover. The Contractor shall be responsible to submit a complete and detailed set of shop drawings, electrical schematic design along with electrical component cut sheets from the MCC panel or the interlock control device manufacturer. RSD Total Control: Allan Pearson 949-380-7878, South Coast Controls: Anthony Ellis 714-998-5656 or approved equal.

2.15 FUSES

- A. Fuses shall be dual element, current limiting type, U.L. Class RK5 unless otherwise indicated on the drawings. Provide one spare set of fuses of each size and type in each motor control center.

2.16 TIME CLOCKS

- A. Time clocks shall be provided for all underwater lighting systems and swimming pool circulation pumps not controlled by filter microprocessors.
- B. Contacts shall have a minimum rating of 40 amperes at 277V.
- C. Timing motor shall be heavy duty synchronous, self starting, high torque type, and shall be rated at 120, 208, 240, 277 volt 60 Hz.
- D. Motor shall operate normally at temperature range of -60 degrees Fahrenheit to +120 degrees Fahrenheit.
- E. Dial shall be 3" diameter, clearly calibrated with day/night zones and 24 hour rotation, with gear to provide one revolution yearly which automatically varies the on/off settings each day according to seasonal changes. Day and month of the year shall show clearly through calendar window on the dial.
- F. Time clocks shall be equipped with 7-spoke omitting wheel marked with days of the week.
- G. Time clocks shall be housed in a corrosion resistant rated enclosure in accordance with the latest NEC requirements.
- H. Acceptable manufacturers are Intermatic, Tork, Paragon, or approved equal.

2.17 GROUND FAULT CIRCUIT INTERRUPTERS

- A. Minimum rating shall be 20 amperes, 125V, 5 milliampere trip setting, Class A per UL943.
- B. Manufacturer to be Crouse-Hinds, Leviton, or approved equal.

2.18 BOXES

- A. Boxes shall be of the size required by ordinances or larger, must be corrosion resistant in accordance with the latest NEC requirements where concealed or exposed on ceilings or walls.
- B. Outlets to be surface where wiring is exposed and flush in areas where conduit is concealed.
- B. Provide surface outlets with proper corrosion resistant surface covers. Box and cover shall be deep enough to provide at least 1/4" clearance between back of device and back of box. Where box contains more than one device, use a corrosion resistant rated gang box with proper cover in accordance with the latest NEC requirements. Surface outlet boxes shall be of the threaded hub type wherever below 8'0".
- C. If necessary for cable installation, additional pull boxes or junction boxes may be installed in accessible locations. Exposed pull boxes and junction boxes shall be corrosion resistant rated in accordance with the latest NEC requirements.
- E. Where exposed to weather pull boxes larger than outlet boxes are required, galvanized code gauge sheet steel boxes may be used with covers attached by brass machine screws may be used. Boxes exposed to the weather shall be approved for the purpose, and conduit entrances shall be on the bottom made by means of an interchangeable hub with gasket and adapter nut. Pull boxes not shown on Drawings may be added only after approval of size and location is obtained.
- F. For outlets exposed to weather or where noted, cast outlet boxes shall be Crouse-Hinds, Appleton, or approved equal. Boxes shall have proper number and size hubs. Device plates, covers, adapters and boxes shall be as manufactured by Crouse-Hinds, Appleton, or approved equal.
- G. Exposed junction boxes, outlet boxes and pull boxes for pool chemical rooms shall be non-metallic suitable for a corrosive environment and in accordance with the latest NEC requirements.

2.19 IDENTIFICATION MARKINGS

- A. Plainly mark all motor and electrical appliance control equipment indicating the equipment controlled with engraved metal tags.
- B. Provide laminated plastic nameplates on panelboards on the outside of the door at the top indicating panel designation and feeder source.
- C. Provide laminated plastic nameplates on distribution switchboards and motor control centers at the top center indicating panel designation and feeder source.
- D. Identify each distribution switchboard and motor control center circuit breaker with a laminated plastic nameplate indicating its' use.
- E. Type panelboard directories on the forms provided with the equipment, indicating the use of each branch circuit breaker.
- F. Fasten all laminated plastic nameplates to surfaces with two (2) or more screws.

3. PART 3 EXECUTION

3.1 INSPECTION

- A. Verify conditions at the Project site before submitting bid. Be responsible for providing all necessary wiring for the new electrical systems. Wherever wiring is being disrupted due to remodeling or changes, reconnect existing and provide new wiring circuits to accomplish a fully operable system at no additional cost to the Owner.

3.2 COORDINATION

- A. The Drawings are essentially diagrammatic and indicate the desired location, size, routes, connection points, etc., and are to be followed as closely as possible. Proper judgment must be exercised in executing the Work so as to provide the best possible installation in the available space and to overcome difficulties, limitations or interference wherever encountered. Be responsible for the correct placement of this Work, the proper location and connection in relation to Work of other trades, for determining the exact location of all conduits, outlets and equipment, and for installing the conduits in such a manner as to conform to the structure, avoid obstruction, preserve headroom and keep openings and passageways clear. Particular attention is directed to the close coordination required on exposed Work. Locations shown on Architectural or Mechanical Drawings if different than those shown on Electrical Drawings should be communicated to the Owner's Representative in writing for clarification.

3.3 INSTALLATION

- A. Trenching and Backfill: Conform with requirements of Section 13 11 01. Provide minimum cover as required by Code.
- B. Conduit Installation:
 - 1. Conduit and metallic raceway systems shall be mechanically and electrically continuous from sources of current to all outlets in a manner to provide a continuous grounding path. Close ends of conduit during construction to prevent entrance of dirt or moisture.
 - 2. Securely fasten conduit to the building construction within three feet of each outlet and within every ten feet thereafter. Secure it to boxes, cabinets, pull boxes, terminals with two locknuts and ends equipped with bushings or a terminal fitting. Cut square with ends carefully reamed.
 - 3. Make bends or elbows so that the conduit will not be injured or flattened.
 - 4. Use insulated metallic bushings in all places where bushings are required.
 - 5. Run exposed conduits level or plumb and parallel to the construction members of the building. No cutting across or diagonal runs will be permitted. Neatly surmount structural obstructions encountered on conduit runs by the use of fittings or pull boxes.
 - 6. Identify feeder conduits by stamped metal tags secured to exposed section of conduit in main or sub-panels.
 - 7. Make up all threaded conduit joints gas and watertight with conductive sealer except conduit above ground in dry indoor locations.
 - 8. Rigidly support all boxes independently of the conduit system.

C. Connections to Equipment:

1. Fully connect, in an approved manner, all electrical outlets, apparatus, motors, equipment, fixtures, wiring devices and appliances whether they are installed under the Electrical Contract or not, which require electrical connections, to the corresponding electrical system outlet.
2. Where the Work of this Section requires connections to be made to equipment that is furnished and set-in-place under other Sections, obtain such roughing-in dimensions from the manufacturer or supplier of each item as required and assume full responsibility for the installation of the connections thereto.

3.4 ADJUSTMENT AND CLEAN-UP

- A. Preliminary Operation: Should the Owner's Representative deem it necessary to operate the electrical installation or any part thereof prior to Substantial Completion of the Work, consent to such preliminary operation and supervise conduction of same. Subcontractor shall pay all costs occasioned by such operation. Preliminary operation shall not be construed as an acceptance of any Work installed under this Contract.
- B. Clean-up: Upon completion of the Work of this Section, immediately remove all swimming pool electrical materials, debris and rubbish occasioned by this Work to the approval of the Owner's Representative.

END OF SECTION

SECTION 22 00 00

PLUMBING

1. PART 1 – GENERAL

1.1 WORK INCLUDED

- A. Furnish all labor, materials, services, testing, transportation and equipment necessary for the completion of all plumbing work as indicated on drawings and specified herein. Work materials and equipment not indicated or specified which is necessary for the complete and proper operation of the work of this Section in accordance with the true intent and meaning of the contract documents shall be provided and incorporated at no additional cost to the Owner.

1.2 QUALITY ASSURANCE

- A. Code Requirements: All work covered by this Section shall conform to the latest requirements of the following regulations:
1. C.C.R., Title 24, Part 5 (2019 CPC).
 2. 2019 California Plumbing Code.
 3. SMACNA Seismic Restraint Manual Guidelines for Mechanical Systems.
 4. National Fire Protection Association.
 5. California Division of the State Architect.
 6. California State Division of Industrial Safety.
 7. County Health Department.
 8. Any other legally constituted body-having jurisdiction thereof.
- B. Nothing in the specifications or drawings shall be construed to permit deviation from the requirements of governing codes unless approval for said deviation has been obtained from the legally constituted authorities having jurisdiction and from the Owner's representative.

1.3 DRAWINGS

- A. Because of the small-scale drawings, it is not possible to indicate all offsets, fittings and accessories which may be required. The Contractor shall carefully investigate the conditions surrounding installation of his work, furnishing the necessary piping, fittings, valves, traps, and other devices which may be required to complete the installation.
- B. The general arrangement indicated on the drawings shall be followed as closely as possible. Coordinate with the Architectural, Structural, Mechanical and Electrical Drawings and the work of other trades prior to installation of piping fixtures and equipment to verify adequate space available for installation of the work shown. In the event a field condition arises which makes it impossible to install the work as indicated, submit, in writing, the proposed departures to the Architect for his approval. Only when Architect's approval is given, in writing, shall Contractor proceed with installation of the work.
- C. Special Note: Should the Contractor make changes in the installation differing from what is indicated on the contract drawings and not necessitated due to field conditions as indicated hereinabove, the Contractor shall be required to re-install the work to comply with what has been indicated on the contract drawings. Should it be impossible to re-install the work and the installation is in accordance with all governing authorities, the architect may permit the installation to remain. However, all costs incurred to revise the contract drawings by the engineer for resubmittal to the building department indicating the as-installed condition shall become the responsibility of the Contractor.
- D. In case of a difference in the specifications or between the specifications and the drawings, the Contractor shall figure the most expensive alternate and after award of contract, shall secure direction from the Architect.

1.4 PERMITS, INSPECTIONS AND LICENSES

- A. All permits, inspections and licenses required by the legally constituted authorities for installation of the work according to the plans and specifications shall be obtained and paid as a part of the work of this section.

1.5 UTILITIES

- A. See Drawings for Points of Connection.
- B. Certain site utilities are to be connected to an extended. Before laying of any pipe or digging of any trenches, Contractor shall determine by actual excavation and measurement exact location and depth of lines to which he is to connect. In event depth of lines is not sufficient to permit connection in manner indicated, Contractor shall obtain direction from the Owner's representative before proceeding with this work.
- C. Verify that utility companies size their services and meters to suit ultimate demand indicated on the drawings.
- D. Gas Service and Meter Assembly: The Contractor shall arrange with the serving utility company to verify if the existing gas service and meter is adequate for the new addition gas load. If the contractor verifies if the service and meter is not adequate, he shall notify the Architect immediately in writing.
- E. Sanitary Sewer: The Contractor shall be responsible for the soil and waste piping outside of the building within five feet (5') of the foundation, and within the building itself. See Civil Engineer's plans for onsite sewer system.
- F. Domestic Water: The Contractor shall be responsible for the domestic water service outside of the building within five feet (5') of the foundation, and within the building itself. See Civil Engineer's plans for onsite domestic water system.

1.6 EXAMINATION OF PREMISES

- A. Before bidding on this work, Contractors shall make a careful examination of the premises and shall thoroughly familiarize themselves with the requirements of the contract. By the act of submitting a proposal for the work included in this contract, the Contractor shall be deemed to have made such study and examination, and that he is familiar with and accepts all conditions of the site.

1.7 PROTECTION

- A. All work, equipment and materials shall be protected at all times. Contractor shall make good all damage caused either directly or indirectly by his own workmen. Contractor shall also protect his own work from damage. He shall close all pipe openings with caps or plugs during installation. He shall protect all his equipment and materials against dirt, water, chemical and mechanical injury. Upon completion, all work shall be thoroughly cleaned and delivered in a new condition.
- B. Contractor shall be held responsible for all damage to equipment and materials until he has received written notice from the Architect or Engineer that his work has been accepted.

1.8 LOCATIONS

- A. The locations of apparatus, piping and equipment indicated on the drawings are approximate. Piping and equipment shall be installed in such a manner as to avoid all obstruction, preserve headroom, and keep openings and passages clear. The locations of and mounting heights of all fixtures shall be coordinated with the architectural plans and room elevations.
- B. Clearances and Openings: Contractor shall cooperate and coordinate his work with all other trades to avoid conflict and permit for a neat and orderly appearance of the entire installation. The Contractor shall, in advance of the work, furnish instructions to the General Contractor as to his requirements for equipment and material installation of any kind, whether or not specifically mentioned on drawings or in the specifications, and shall include recesses, chases in walls, and all required openings in the structure. Should furnishing this information be neglected, delayed or incorrect and additional cuttings are found to be required, the cost of the same shall be charged to this Contractor.

- C. Contractor shall verify and coordinate pipe routing with location of all electrical rooms, elevator equipment rooms, telecom/data rooms, and other rooms dedicated to the housing of switchgear, panels, or other electrical equipment. In no case shall piping be installed within or above the ceiling of such rooms.

1.9 SUBMITTAL DATA (Also see General Conditions)

A. Submittal Requirements:

1. Furnish, all at one time, prior to any installation, within the time noted below, six (6) copies of valid submittal data on all fixtures, material, equipment and devices. Each submitted item shall be indexed and referenced to these specifications and to identification numbers on fixtures and equipment schedules.
2. Manufacturers' submittal literature and shop drawings are required on all items to ensure the latest and most complete manufacturer's data is available for review. Requirements of the submittals and Engineer's submittal notes are a part of the work of this Division except that Engineer's notes may not be used as a means of increasing the scope of work of this Division.
3. Submittals will be checked for general conformance with the design concept of the project but the review does not guarantee quantities shown and does not supersede requirements of this Division to properly install work.
4. To be valid, all submittals must:
 - (a) Be delivered to the Architect's office within thirty-five (35) days of award of the contract. Contractor shall make time allowance for Engineer's review, return of comments, if any, and resubmittal if required. Corrections or changes in submittals returned as inadequate or incomplete shall be accomplished within this time limit.
 - (b) Clearly indicate and label as such any items proposed as substitution for that specified or shown on plans.
 - (c) Include all pertinent construction, installation, performance and technical data.
 - (d) Have all product data sheets clearly labeled to indicate the individual items being submitted. In addition, all required options and accessories shall be clearly marked.
 - (1) Product data sheets corresponding to items indicated on plans shall be clearly labeled with the corresponding fixture or equipment tag number.
 - (2) Product data sheets corresponding to items indicated in specifications shall be clearly labeled with the specification section, page and item numbers.
 - (e) Include, for every item which differs in size, configuration, connections, service, accessibility or any other significant way, a drawing to the same (or larger) scale as to the pertinent portions of the contract drawings. In this drawing show a complete layout of the system except that which is identical to the contract drawings, unless the unchanged portions must be shown to indicate such things as clearances. This drawing, together with the contract design drawings must show the complete system as revised to accommodate the proposed alternate.

B. Substitution Requirements:

1. Any items included in submittals and proposed by the Contractor as substitution for that specified or shown on plans shall be submitted within thirty five (35) days of award of the contract. After such time, proposed substitutions shall not be accepted for review, and the Contractor shall submit all items as specified or shown on plans.
 - (a) For each item proposed as substitution for that specified or shown on plans, copies of product data sheets for the specified item shall be placed side by side with product data sheets for the proposed substitution item within the submittal.
 - (1) In addition to the Submittal Requirements for labeling listed above, product data sheets for the specified item shall be clearly labeled "SPECIFIED ITEM, NOT SUBMITTED". Product data sheets for the corresponding proposed substitution item shall be clearly labeled "PROPOSED SUBSTITUTION".
 - (b) Provide calculations and other detailed data justifying how any items proposed as substitution were selected for proposal. Data must be complete enough to permit detailed comparison of every significant characteristic for which the specified item was analyzed during design.
2. It shall be the Contractor's responsibility to provide sufficient information to allow the Engineer to analyze any proposed alternate. If inadequate information is provided, the proposal will not be approved and resubmittal will not be allowed.
3. The Contractor shall provide or perform tests required by Engineer for purpose of judging acceptability of proposed substitutions.
4. The Contractor assumes full responsibility that alternate items and procedures will meet the job requirements and is responsible for cost of redesign and of modifications to this and other parts of work caused by alternate items furnished under work in this Section. In view of these responsibilities, it is the purpose of these specifications to establish procedures to ensure that the Contractor has considered all the ramifications of proposed alternates before submitting them for review. Submittals which do not comply with the requirements of these specifications or which indicate proposed alternates that were selected without proper regard to the requirements of the job will not be approved. No more than one proposed alternate will be considered for each item.
5. Alternate items installed without Engineer's approval will be replaced with specified items at Contractor's expense.
6. The Architect or his authorized representative shall be the sole judge as to the quality and suitability of proposed alternate equipment, fixtures or materials. Decisions of the Architect or that of his representative shall be final and conclusive.

1.10 UNINSPECTED WORK

- A. The Contractor shall not allow or cause any of his work to be covered up or closed in until it has been inspected, tested, approved by all authorities have jurisdiction, and until Project Record drawings have been properly annotated.
- B. Should any of his work be covered up or closed in before such inspection, he shall, at his own expense, uncover the work to the satisfaction of the inspection party. All related repair work cost shall be borne by the Contractor.

1.11 RECORD DRAWINGS (Also see General Conditions)

- A. Contractor shall provide and keep up-to-date a complete "as-built" record set of blue-line prints which shall show every change from the original drawings and the exact "as-built" locations and sizes of the work provided under this Section of the specifications. This set shall include locations, dimensions, depth of buried piping, clean-outs, shut-off valves, sewer invert locations, plugged wyes, tees, etc. On completion of the work, the Contractor shall incorporate all as-built information on a set of reproducible tracings provided by the Architect and this set of reproducible tracings shall be delivered to the Architect.

1.12 GUARANTEES (Also see General Conditions)

- A. Contractor shall guarantee the entire plumbing and piping systems unconditionally for a period of one (1) year after final acceptance. If, during this period, any materials, equipment, or any part of the systems fail to function properly, the Contractor shall make good the defects promptly and without any expense to the Owner.
- B. Contractor shall be responsible for all damage to any part of the premises caused by leaks in pipelines or equipment furnished and installed under this Section for a period of one (1) year after date of acceptance of his work.
- C. All equipment and fixtures shall carry manufacturer's warranty against defective parts or poor workmanship for not less than one (1) year. See specific equipment specifications for extended warranty requirements.

2. PART 2 – PRODUCTS

2.1 MATERIALS AND EQUIPMENT (See Schedules on Drawings)

- A. General: All materials, as specified or required in the work, shall be new, free from defects and imperfections. All manufactured shall comply with California Assembly Bill 1953.
- B. Pipe and Fittings:
1. Soil and Waste Piping:
 - (a) Soil and waste piping within the building itself and outside within five feet (5') of the foundation, shall be no-hub cast iron pipe and fittings, asphaltum coated, free from defects, and shall comply with CISPI Standard 301, ASTM A-888 or ASTM A-74. Pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute. Fittings shall be made up with "Husky" SD 4000 series or "Clamp All" HI-TORQ 125 series stainless steel type 304 couplings and shall conform to ASTM C1540 & ASTM C564 except all above ground vent pipe fittings may be made with "Anaco" or "Tyler" stainless steel two band couplings conforming to CISPI Standard 310.
 2. Vent Piping:
 - (a) Concealed or underground vent piping shall be cast iron pipe and fittings as specified for soil and waste piping.
 - (b) Exposed vent piping shall be Schedule 40 galvanized steel pipe, ASTM A53, with black cast iron recessed drainage fittings.
 - (c) Vent piping within and passing through fire rated partitions shall be no-hub cast iron service weight pipe and fittings, asphaltum coated, free from defects, and shall comply with C.I.S.P.I. Standard 301-00 or ASTM A-888-98. Fittings shall be made up with "Anaco" or "Tyler" stainless steel two band couplings and shall comply with ASTM C564.
 - (1) All vents through roof shall terminate with vandal proof caps (Refer to "Roof Flashing" herein).

3. Domestic Water Piping:
 - (a) Piping within the building and above grade shall be Type "L" ASTM B88, hard drawn copper tubing with wrought copper sweat fittings ANSI B16.18 and B16.22.
 - (b) Outdoor underground piping in sizes 2-1/2" and 3" shall be Type "L" ASTM B88, hard drawn copper as specified for water piping within the building. Piping 2" and smaller shall be Type "K" ASTM B88, hard drawn copper with wrought copper sweat fittings ANSI B16.18 and B16.22. Piping below the building floor shall be Type "K" soft annealed copper tubing with no fittings below the slab.
4. Air Conditioning Condensate Drain Piping.
 - (a) Shall be Type "M" copper as specified for water piping.
5. All exposed piping at plumbing fixtures shall be chrome plated yellow brass except exposed pipes in shop or utility areas.
6. Unions or flanges shall be furnished and installed at each threaded connection to all equipment or valves. The unions or flanges shall be located so that the piping can be easily disconnected for removal of the equipment, tank, or valve, and shall be of the type specified in the following schedule.
 - (a) Unions:
 - (1) Black Steel Pipe: 250 pound screwed black malleable iron, ground joint, brass to iron seat.
 - (2) Galvanized Steel Pipe: 250 pound screwed galvanized malleable iron, ground joint, brass to iron seat.
 - (3) Copper or Brass Tubing: 150 pound cast bronze or copper, ground joint, nonferrous seat with ends, by Walseal, Nibco or Mueller.
 - (b) Flanges: Tube Turn or approved equal, raised face 150 pound class forged steel, weld, neck or slip-on type conforming to ASA B16.5 and ASTM A181. For copper piping systems, provide flanges conforming to ANSI B16.24. The faces of the flanges being connected to be alike in all cases. Locate flanges so that the piping can be easily disconnected for removal of the equipment or valve. Gasket material shall be of material suiting the service of the opening system in which installed and which conforms to its respective ANSI Standard (A21.11. B16.21). Provide materials that will not be detrimentally affected by the chemical and thermal conditions of the fluid being carried.
7. All piping on roof shall be supported by pipe supports as manufactured by MAPA Products. Products by Miro Industries and Erico shall be accepted for submittal review.
 - (a) Pressurized Piping:
 - (1) For pipe sizes 1" and less: MS-1 single post, adjustable height pipe support.
 - (2) For pipe sizes 2 1/2" and less: MS-4 adjustable, roller pipe support.
 - (3) For pipe sizes 4" and less: MS-5 adjustable, roller pipe support.
 - (b) Gravity System Piping 2" and less: MS-1 single post, adjustable height pipe support.
8. All underground non-metallic piping shall have 14 gauge copper "Tracer Wire" continuous for entire length.

C. Valves:

1. General:

(a) Piping systems shall be supplied with valves arranged so as to give complete and regulating control of each building and piping systems throughout the building, and located so all parts are easily accessible and maintained.

(1) Valve Design: Rising stem or outside screw and yoke stems. Non-rising stem valves may be used where space conditions prevent full extension of rising stems.

(2) Sizes: Same size as upstream pipe, unless otherwise indicated.

(3) Extended stems: Where piping insulation is indicated or specified, valves shall be equipped with 2" extended handles of non-thermal conductive material. Also provide a protective sleeve that allows operation of the valve without breaking the vapor seal or disturbing the insulation. Supply with memory stops, which are fully adjustable after insulation is applied.

(4) End Connection: 2 inch and under shall be threaded, 2-1/2 inches and larger shall be flanged or full lug style.

(b) Valves for Potable Water must comply with California Lead Free Law, effective January 1, 2010.

(1) "Lead Free" refers to the wetted surface of pipe, fittings and fixtures in potable water systems that have a weighted average lead content \leq 0.25%. Source: California Health & Safety Code (116875).

(2) All valves must be 3rd party certified.

(3) Bronze valves shall be made with dezincification-resistant material.

(c) Where possible, valves of one manufacturer shall be used.

(d) Provide Class 150 valves meeting the valve specifications where Class 125 valves are specified but are not available.

2. Approved Manufacturers. The following manufacturers (or equal) shall be accepted for submittal review provided that all features and options are equivalent to the corresponding items as specified.

(a) General valves.

(1) NIBCO

(2) Hammond

(3) Milwaukee

(b) Below grade domestic water shut-off valves (gate valves) 2" and larger.

(1) NIBCO.

(2) Clow.

(3) Mueller.

- (c) Plug Valves.
 - (1) Hammond.
 - (2) Milwaukee.
- 3. Gate Valves.
 - (a) Gate Valves, 1-1/2-Inch and Smaller.
 - (1) Rising Stem: Valves shall be Class 125 and 200 PSI CWP, rising stem, union bonnet, solid wedge and manufactured in accordance with MSS-SP 80. Body, bonnet and wedge shall be of bronze ASTM B-62. Stems shall be of dezincification-resistant silicon bronze ASTM B-371 or low-zinc alloy B-99, non-asbestos packing and malleable or ductile iron hand wheel. Valve ends shall be threaded.
 - a) Acceptable Valves: NIBCO T124 (threaded), or approved equal.
 - (2) Non-Rising Stem: Valves shall be Class 125 and 200 PSI CWP, non-rising stem, screw-in bonnet, solid wedge and manufactured in accordance with MSS-SP-80 and NSF-61-G. Body, bonnet, external stuffing box and wedge shall be of bronze ASTM B-584 C87850. Stems shall be of dezincification-resistant silicon bronze ASTM B-371 C69400 or ASTM B-99 C65100, Aramid Fibers with graphite packing and malleable iron hand wheel. Valve ends shall be threaded.
 - a) Acceptable Valves: NIBCO T113-LF (threaded), or approved equal.
- 4. Ball Valves, 2 Inches and Smaller.
 - (a) Valves shall be rated 250°F: 330 psig/600 PSI CWP, shall have 2-piece full port lead free dezincification resistant bronze bodies with TFE seats and seals, stainless steel stem, separate packing nut with blow-out proof adjustable stem packing, and vented stainless steel ball. Valves shall conform to ASTM B371 C69300, or ASTM B-584 C87850 and conform to MSS-SP-110 and NSF-61-G.
 - a) Acceptable Valves: NIBCO T-68580-LF (threaded), or approved equal.
- D. Traps, Strainers and Tailpieces: Every sanitary fixture, unless otherwise specified, shall be provided with a seventeen (17) gauge chromium tailpiece, a Los Angeles pattern chrome plated cast-brass trap and galvanized nipple trap arm and wall flanges. Trap arm shall be provided with chromium plated brass casing between the trap and wall flanges at each fixture. All sanitary waste system floor drains and floor sinks shall have cast iron "P" traps.
- E. Cleanouts: Shall be Jay R. Smith and Zurn.
 - 1. General: Provide cast-iron ferrule and countersunk brass clean-out plug with round cast iron access frame and heavy duty secured top cover.
 - 2. Wall Cleanouts: Jay R. Smith No. 4472 for steel pipe and Jay R. Smith No. 4532 for cast iron pipe.
 - 3. Floor Cleanouts: Jay R. Smith No. 4023 or 4028, bronze plug and non-skid nickel bronze top.
 - 4. Cleanouts to Grade: Jay R. Smith No. 4258 or Jay R. Smith No. 4253 with X-H bronze plug and X-X-H non-skid cover with lifting device set flush with surface for concrete areas. Asphalt or nonsurfaced areas shall be installed with ring of concrete poured around the bottom flange six inches (6") below surface. Use cast iron soil pipe on cleanout risers. For cleanouts in non-traffic areas, terminate cleanout plug in concrete yard box.

- F. Access Panels: Wall access panels shall be minimum 12" x 12" for concealed valves and other equipment unless otherwise specified or indicated. Ceiling access panels shall be 18" x 18" minimum. Access panels shall be located and positioned for ready access and service of equipment housed within. Where access panels are specified with keyed cylinder locks, all such locks shall be identically keyed.
1. Wall, Non-Fire Rated: Elmdor/Stoneman DW-SS-CL, drywall, stainless steel finish, cylinder lock.
 2. Ceiling, Non-fire Rated: Elmdor/Stoneman DW, drywall, prime coated finish, screwdriver latch.
 3. Wall, Fire Rated: Elmdor/Stoneman FR-SS-CL, fire rated, stainless steel finish, cylinder lock.
 4. Ceiling, Fire rated: Elmdor/Stoneman FRC, Fire rated, prime coated finish, return latch.
- G. Yard Boxes & Vaults: For service shut-off valves on gas and domestic water; for pressure regulator assemblies and for cleanouts, shall be Brooks Products or Fraser Cement Products Co., rectangular concrete type with vandal-proof cast iron cover and name of service clearly marked on cover. Box shall be of size to permit full range of valve operation and to permit easy removal of valve assembly. Vaults shall be sectional type.
- H. Roof Flashing:
1. Sanitary vents thru roof and grease vents thru roof: Stoneman No. 1100-5, one (1) piece, seamless, four (4) pound, series with reinforcing steel boot counterflashed with cast iron flashing sleeve and equipped with vandal-proof hood for all vent piping. Seal joint between flashing and pipe with waterproofing compound per flashing manufacturer's recommendations.
 2. Water, gas, condensate drainage and other metallic piping thru roof: Stoneman No. 1100-4, one (1) piece, seamless, four (4) pound, series with reinforcing steel boot counterflashed with cast iron flashing sleeve. Seal joint between flashing and pipe with waterproofing compound per flashing manufacturer's recommendations
- I. Escutcheons: Shall be chrome plated cast brass with setscrew locking device.
- J. Water Hammer Arresters: Shall be sized per the manufacturer's recommendations. Install at all quick closing valves, clothes washers and dishwashers behind access panel.
- K. Dielectric Union Isolators: Connection between incompatible materials above grade and inside building shall be made with two (2) dielectric unions separated by a twelve inch (12") section of red brass pipe. Dielectric union isolator for connection piping or non-compatible materials shall be of standard commercial design with threaded connections.
- L. Pipe Supports: Unless otherwise indicated on the drawings, shall be as follows:
1. The Contractor shall furnish and install all miscellaneous iron work including angles, channels, etc., required to appropriately support the various piping systems. Hanger spacing and location shall conform to 2010 California Plumbing Code Table 3-2.
 2. All horizontal runs of piping within the building to be supported from the structural framing with steel rods and split ring hangers, B-Line, Grinnell Company, Tolco, or approved equal. Steel rods shall be secured to overhead framing with side beam connectors. Where necessary, install angle iron between framing to accommodate hanger rods. Where several pipes are running together, Unistrut, B-Line or Powerstrut channels with clamps may be used in lieu of individual pipe hangers, and supported from structure as herein specified. Submit test data for type of hanger supports to be provided. For support conditions other than specified herein, the Contractor shall submit method of support for approval prior to any installation.

3. Horizontal Piping Hangers and Supports:
- (a) General: Provide factory fabricated horizontal hangers and supports complying with one of the following MSS types listed to suit horizontal-piping systems, in accordance with MSS SP-69 and manufacturer's published product information. Select size of hangers and supports to exactly fit pipe size for bare piping, and to exactly fit around piping insulation with saddle or shield for insulated piping. Provide copper-plated hangers and supports for copper-piping systems.
 - (1) Adjustable Steel Clevis Hangers: (MSS Type 1.) B-Line B 3100
 - (2) Adjustable Swivel Pipe Rings: (MSS Type 5) B-Line B3690
4. Vertical-Piping Clamps:
- (a) General: Provide factory fabricated vertical-piping clamps complying with the following types listed, to suit vertical piping systems, in accordance with MSS SP-69 and manufacturer's published product information. Select size of vertical piping clamps to exactly fit pipe size of bare pipe. Provide copper-plated clamps for copper-piping systems.
 - (b) Two-Bolt Riser Clamps: (MSS Type 8) B-Line B3373
5. Hanger-Rod Attachments:
- (a) General: Provide factory fabricated hanger-rod attachments B-Line, Tolco or approved equal, selected by Installer to suit horizontal-piping hangers and building attachments, in accordance with MSS SP-58 and manufacturer's published product information. Select size of hanger-rod attachment to suit hanger rods. Provide copper-plated hanger-rod attachments for copper-piping systems.
 - (b) Side beam eye socket, Tolco Fig. #57 for rod sizes 3/8" dia. and Tolco Fig. #25-30-251 for rod sizes 1/2" dia.
6. Building Attachments:
- (a) General: Provide factory fabricated building attachments, selected by Installer to suit building structural framing conditions, in accordance with MSS SP-69 and manufacturer's published product information. Select size of building attachments to suit hanger rods. Provide copper-plated building attachments for copper-piping systems.
7. Hanger Rods and Spacing shall conform to the following table:
- | Pipe Sizes | Spacing | Rods |
|----------------------|---------|----------|
| 2 Inch and Smaller | 6 Feet | 3/8 Inch |
| 2-1/2 Inch to 3 Inch | 8 Feet | 1/2 Inch |
| 4 Inch and larger | 8 Feet | 5/8 Inch |
8. Hangers and Supports shall be adequate to maintain alignment and prevent sagging and shall be placed within 18 inches of joint. Support shall be provided at each horizontal branch connection.
9. Provide lateral bracing as manufactured by B-Line or approved equal for all piping to prevent swaying or movement in accordance with SMACNA "Guidelines for Seismic Restraints of Piping Systems". Piping smaller than indicated in the guidelines shall be provided with bracing as specified for the smallest size indicated. The entire water distribution system shall be properly braced and will not move due to the action of quick closing of valves.
10. Miscellaneous Supports, Wall Brackets, Etc.: Provide where required in accordance with the best standard practices of the trade. Submit shop drawings for all fabricated supports.

11. Isolators. All piping which is not isolated from contact with the building by its insulation shall be installed with a manufactured type isolator. Isolators shall be B-Line vibra clamp and cushion, Super Strut, Stoneman "Trisolator", or approved equal. Piping shall be installed and supported in a manner to provide for expansion without strains. Guides shall be properly installed to ensure this requirement.

12. Shields:

- (a) General: Provide shields at piping hangers and supports, factory-fabricated, for all insulated piping as manufactured by Pipeshields Incorporated or approved equal. Size shields for exact fit to mate with pipe insulation.
- (b) Protection Shields: MSS Type 40; provide high density insert of same thickness of insulation or equal 100-psi average compressive strength, waterproofed calcium silicate, encased with a sheet metal shield. Insert and shield shall cover entire circumference of the pipe and shall be of length indicated by manufacturer for pipe size and thickness of insulation.

M. Insulation:

1. All fixtures complying with the provisions of the Americans with Disabilities Act shall be provided with Prowrap insulation for exposed hot water pipe, tailpiece, and trap as manufactured by McGuire, and secured per manufacturers recommendations. No tape wrapping shall be permitted.

N. Equipment and Fixtures:

1. Fixtures:

- (a) See schedule on drawings.
- (b) Accessible plumbing fixtures shall comply with all of the requirements of CBC Section 1115B. Heights and location of all fixtures shall be in according to CBC Section 1115B.4 and Table 1115B-1. Fixture controls shall comply with CBC Section 1115B.4.4.4 for showers, 1115B.4.3.1 for lavatories, 1115B.4.1.5 for toilets and 1115B.4.2.3 for urinals. Sinks shall not exceed 6-1/2" in depth, CBC Section 1115B.4.7.1.

2. Acceptable Manufacturers.

- (a) The following manufacturers (or equal) shall be accepted for submittal review provided that all features and options are equivalent to the corresponding items as specified on plans and in specifications:
 - (1) Vitreous China Plumbing Fixtures.
 - a) American Standard.
 - b) Kohler.
 - (2) Flushometer Valves.
 - a) Sloan.
 - (3) Toilet Seats.
 - a) Bemis.
 - b) Olsonite.
 - c) Church

- (4) Stainless Steel Self Rimming Sinks.
 - a) Elkay.
 - b) Just.
 - (5) Faucets.
 - a) Chicago.
 - (6) Lavatory and Sink Drains.
 - a) McGuire.
 - b) Zurn
 - c) Just
 - (7) Angle Stops / Supplies.
 - a) Chicago.
 - (8) Water Hammer Arrestors.
 - a) Mifab.
 - b) Precision Plumbing Products.
3. Furnish complete with necessary trim, including stops. All trim and fittings shall be chrome-plated brass including handles, supply tailpieces, traps and escutcheons.
 4. Connections to fixtures shall be in accordance with code requirements except as exceeded herein or on the drawings and in no case less than the supply stop size.
 5. All plumbing fixture faucets submitted for review shall have identification label or certification showing compliance with California TITLE 24, PART 5, ARTICLE I, "Energy Conservation Standards". ARTICLE I, T20-1406; ARTICLE 2, T20-1525 and ARTICLE 4, 1604 and 1606.
 6. Minimum waste sizes shall be four-inch (4") for water closets and two inch (2") for lavatories.

3. PART 3 – EXECUTION

3.1 INSTALLATION - GENERAL

- A. Locations and Accessibility: Install equipment for ease of maintenance and repair. If changes in the indicated locations or arrangements are made by the Contractor, they shall be made without additional charges.
- B. Openings: Furnish information to the other trades on size and location of openings which are required in walls, slabs, roof, for piping and equipment at the proper times.
- C. Closing-In of Uninspected Work: Do not allow or cause any of the work to be covered up or enclosed until it has been inspected, tested, and approved by the Architect. Any work enclosed or covered prior to such inspection and test shall be uncovered and, after it has been inspected, tested, and approved, make all repairs with such materials as may be necessary to restore all work, including that of other trades, to its original and proper condition.
- D. Before laying of any pipe or digging of any trenches, Contractor shall determine by actual excavation and measurement exact locations and depth of existing utility and service lines to which he is going to connect. In event depth of existing sewer main or storm drain is not sufficient to permit installation of piping as detailed on drawings or to make connection in manner indicated, Contractor shall confer with the Architect, Owner's representative and Engineer for Direction.

- E. Excavation, Trenching and Backfill: Perform all necessary trench excavation, shoring, backfilling and compaction required for the proper laying of the pipe lines.
1. The Contractor shall coordinate the layout of all below grade piping and components with the General Contractor prior to bid to determine the extent of required sawcutting, excavation, alterations, and subsequent repair/restoration of all affected hardscape and softscape surfaces. All such items shall be included in bid.
 2. Backfill shall be clean soil free from rocks and debris. Compact to ninety percent (90%) of surrounding soil. All piping shall be installed in a minimum 6" sand bed and covered with 6" of sand prior to backfill. Continue backfill with materials free of rocks and debris, properly moistened and mechanically tapered and compacted to 90% of surrounding soil.
 3. Water, soil and waste piping shall have twenty-four (24") of cover minimum, except all PVC pipe material and all gas piping shall have eighteen (18") of cover minimum. All other pipe shall have not less than eighteen inches (18") of cover, unless otherwise noted on the drawings. Offset gas and water piping as required to permit crossover of underground piping systems, and electrical conduit systems.
 4. Bottoms of Trenches: Cut to grade and excavate bell holes to ensure the pipes bearing for their entire length upon the outside periphery of the lower third of the pipe.
 5. Water piping shall not be run in the same trench with sewer or drainage piping unless separated as required by the CPC.
 6. All horizontal soil and waste piping 3" and smaller shall be installed to a uniform grade of not less than one-fourth inch (1/4") per foot. All horizontal soil and waste piping 4" and larger shall be installed to a uniform grade of not less than one-eighth inch (1/8") per foot, unless otherwise indicated or directed.
- F. Piping Installation:
1. All piping shall be concealed in finished portion of the building except where otherwise indicated or directed at the time the work is done. All piping shall be installed to clear all framing members and beams, even if drawings do not indicate same. Contractor shall constantly check the work of other trades so as to prevent any interference with the installation of this work.
 2. All piping into stem walls and footings shall be double half lap wrapped with 1/8" thick "Armaflex" insulation. The Contractor shall also provide blocked out areas in stem wall and footing as required for the installation of the piping. All piping shall avoid the lower 9" of the footing and the Contractor shall coordinate and provide dropped footings as required for the installation of the underground piping.
 3. Unions shall be installed on one side of all screwed shut-off valves, at both sides of screwed automatic valves and on all by-passes, at all equipment connections and elsewhere as indicated or required for ease of installation and dismantling.
 4. Connections between copper tubing and equipment shall be with Mueller Brass Company, or approved equal, brass stream line copper to P.P.S. ground joint unions.
 5. Hot and cold water supplies to lavatories and sinks shall be provided with ninety degree (90°) drop-ear copper to pipe thread elbows. Cold water supplies to water closets and urinals shall be provided with ninety degree (90°) drop-ear copper to pipe thread elbows. Bolt securely to backing plates located between wall studs to provide a rigid anchor for exposed supply pipes and stops.

6. Corrosion Protection:

(a) General.

- (1) Corrosion protection shall be provided for all below grade cast iron and copper piping and associated valves and fittings. Such piping shall be protected from corrosion by encasement in a polyethylene protective wrapping, referred to hereafter as polywrap. Although not intended to be a completely air and water tight enclosure, the polywrap shall provide a continuous barrier between the pipe and surrounding bedding and backfill.

(b) Materials.

(1) Cast iron piping encasement.

- a) The polywrap shall be minimum 8 mil. in thickness, group 2, linear low density, flat tube, natural (clear) virgin polyethylene film formed into tubes or sheets as required. Material shall meet or exceed the requirements of AWWA C105, ANSI A21.5 and ASTM A674.
- b) The polywrap shall be as manufactured by Northtown Company or approved equal.

(2) Copper piping encasement.

- a) The polywrap shall be minimum 6 mil. in thickness, group 2, linear low density, flat tube, natural (clear) virgin polyethylene film formed into tubes or sheets as required. Material shall conform to the requirements of ASTM D1248.
- b) The polywrap shall be as manufactured by Northtown Company or approved equal.

(3) The minimum Polywrap flat tube width for each pipe diameter shall be as follows:

<u>Pipe Size / Type</u>	<u>Polywrap Flat Tube Width</u>
½" to ¾" copper	2"
1" to 1-½" copper	3"
2" copper	4"
2-1/2" copper	5"
3" copper	6"
2" to 3" cast iron	14"
4" cast iron	16"

(4) The polywrap shall be secured as specified with 2 inch wide pressure sensitive plastic tape not less than 10 mils thick.

- a) Tape shall be Scotchwrap No. 50, Polyken No. 900, Tapecoat CT, Johns-Manville No. V-10 Trantex or approved equal.
- b) Piping through exterior walls shall be sealed using Link Seal modular seal with nitrile seal elements and stainless steel bolts.

(c) Installation.

- (1) The polyethylene tubing shall be cut into lengths approximately 2 feet longer than the pipe sections. Slip the tube around the pipe, centering it to provide a 1-ft overlap on each adjacent pipe section, and bunching it accordion fashion lengthwise until it clears the pipe ends. Lower the pipe into the trench and make up the pipe joint with the preceding section of pipe. A shallow bell hole must be made at each joint to facilitate installation of the polywrap. The bunched-up polywrap shall be pulled from the preceding length of pipe, slipped over the end of the new length of pipe, and secured in place with one circumferential turn of tape plus enough overlap to assure firm adhesion. The end of the polywrap shall be slipped from the new pipe section over the end of the first wrap until it overlaps the joint at the end of the preceding length of pipe and tape it in place. The loose wrapping on the barrel of the pipe shall be pulled snugly around the barrel of the pipe and excess material folded over the top of the pipe and the folds held in place by means of short strips of adhesive tape, at about 3 foot intervals along the pipe.
- (2) Rips, punctures or other damage to the tube shall be repaired with the adhesive tape or pieces of tube material secured with tape. Bends and reducers in the line shall be covered with polyethylene in the same manner as pipe.
- (3) Valves, tees, crosses and outlets shall be wrapped with flat sheets of the same material. The sheets shall be passed under valves and brought up around the body to the stem. Edges shall be brought together, folded twice and secured with the adhesive tape.

G. Sleeves: Shall be plastic or galvanized steel where pipes pass through concrete walls or floor slabs.

1. Isolate pipes through ground floor slabs with Kraft paper, plastic tape or similar materials unless conduit is specified or indicated.
2. Sleeves for pipes through exterior walls shall be non-metallic with minimum 2" weep ring as manufactured by Link Seal. Pipe shall be sealed with Link Seal modular seal with EPDM seal elements.
3. Sleeves in or through fire rated walls shall be per U.L. Fire Resistance System No. WL1146 for drywall construction, and U.L. Fire Resistance System No. CAJ1044 for concrete construction. See architectural plans for all locations of rated walls.
4. Below-grade piping through exterior walls shall be sealed using Link Seal modular seal with nitrile seal elements and stainless steel bolts and sleeves as manufactured by Century Line.

H. Contraction and Expansion: Install all work in such a manner that its contraction and expansion will not do any damage to the pipes, the connected equipment, or the building. Install offsets, swing joints, expansion joints, seismic joints, anchors, etc., as required to prevent excessive strains in the pipe work. All supports shall be installed to permit the materials to contract and expand freely without putting any strain or stress on any part of the system. Provide anchors as necessary.

I. Pipe Joints and Connections:

1. Copper Tubing and Brass Pipe with Threadless Fittings:
 - (a) Solder joints for copper shall be made with 95/5 lead free solder in accordance with manufacturer's recommendations for the service intended.
 - (b) Use threaded adapters on copper tubing where threaded connections are required.

- J. All closet bends shall be adequately blocked and secured. Trap arms and similar connections installed below the floor level or under concrete slabs shall be adequately supported and anchored to prevent motion in any direction. All piping installed above grade within buildings shall be secured to structural framing with Unistrut or pipe clamps to provide a rigid installation. Piping utilizing gaskets as a seal shall be given prime consideration to providing adequate stability through proper supports and anchors because of its flexible nature.
- K. Each pipe penetration of the roof shall be separated from other piping and any roof equipment by a minimum of 18" to insure a proper pipe flashing installation.
- L. Floor, Wall and Ceiling Plates: Where pipes pierce finished surfaces, C.P. brass split flanges with setscrew lock shall be provided.
- M. Installation of Plumbing Fixtures:
 - 1. Install each fixture at the exact height and location shown on the Architectural Drawings.
 - 2. Set fixtures, supplies, trap and trap outlet square with the wall, in line with fixture outlets without any offsets, angles, or bends.
 - 3. Grout joint between the fixtures and the walls or floors with polysulfide or silicone sealant to be smooth, even and watertight.
- N. Completion of Installation:
 - 1. Cleaning and Flushing: Clean all equipment and materials thoroughly. Leave surface to be painted smooth and clean, ready for painting.
 - 2. Flush each unit of water supply and distribution system thoroughly with clean water at the highest velocities attainable.
 - 3. Clean all piping, valves, traps, water heaters, fixtures and other devices thoroughly and flush or blow out until free of scale, oil silt, sand, sediment, pipe dope and foreign matter of any kind.

3.2 STERILIZATION OF DOMESTIC WATER LINES

- A. Sterilize water lines by filling with a solution containing fifty (50) parts of chlorine per million parts water and holding the solution therein for at least eight (8) hours with a water head of at least five feet (5') above the highest point in the system. Unless otherwise directed, thoroughly flush each line prior to sterilization. Introduction of sterilizing solution or materials into the lines shall be such as to provide thorough and uniform distribution throughout the system.
 - 1. Operate all valves during the retention period. Following retention period, the heavy chlorinated water shall be flushed from the system with clean water.
 - 2. Continue flushing until the residual chlorine at the end of 24 hours is as required by AWWA C651.
 - 3. All work and certification of performance must be done by an approved laboratory utilizing qualified applications and personnel.
 - (a) Upon completion of the domestic water line sterilization, Contractor shall submit sterilization report directly to the Architect stating that all testing was performed as specified and that testing was performed by an approved laboratory utilizing qualified applications and personnel.

3.3 TESTING

- A. No piping work shall be concealed or covered until piping has been tested, inspected and approved by the Inspector. All piping for plumbing systems shall be completely installed and tested as required by the Uniform Plumbing Code. Test pressures and times indicated are a minimum only. All tests shall be as required by the governing authority as well.

Schedule of Test Pressures:

<u>System Tested</u>	<u>Gauge</u>	<u>Test</u>	<u>Duration</u>
Water	100 PSI	Water	4 Hours

Waste, Vent and Storm Drain: Per California Plumbing Code (Minimum 10 Feet of Head)

3.4 OPERATION INSTRUCTION

- A. Prior to occupancy or prior to the date of final inspection, whichever may occur first, the Contractor shall prepare two (2) sets of typewritten instructions for the operation of all equipment, valves, etc., specified and furnished as a part of the work under this section, and shall assign a competent person, thoroughly familiar with the job, to demonstrate and instruct a representative of the Owner in the operation of the equipment. The time of said demonstration and instructions shall be arranged with the Owner's representative approximately one (1) week in advance. Verbal instructions shall include shut-off location of gas and water. The Contractor shall assemble all operation and maintenance data supplied by the manufacturers of the various pieces of equipment, all keys and special wrenches required to operate and service the equipment (including keys for yard boxes, gas stops and fixture stops), and all equipment warranties and deliver same to the representative of the Owner on date of said instructions.

3.5 PIPE AND EQUIPMENT IDENTIFICATION

- A. Each operating and service line shut-off valve shall be identified by a 19 ga. brass tag with stamped, engraved type of service identified and area served, complete with hole and brass chain mounted on valve stem or handle. Tag shall be a minimum of one and one-half inch (1-1/2") in diameter.
- B. All piping systems shall be readily identifiable by appropriate labeling with the name of the piping contained. Such labeling shall be by means of metal tags, stenciling, stamping, or with adhesive markers, in a manner that is not readily removable. Labeling shall appear on the piping at intervals of not more than 20 ft and at least once in each room and each story traversed by the piping system.
- C. Provide on exterior wall of each building opposite the building's main gas service a sign reading "Gas Shut Off". Sign shall be metal with minimum 1-1/2" high-embossed letters.
- D. All equipment shall be provided with name plate indicating all pertinent information on it.

END OF SECTION

SECTION 23 00 00

HEATING, VENTILATION, AND AIR CONDITIONING

1. PART 1 GENERAL

1.1 DESCRIPTION

- A. Work under this section includes all labor, equipment, material, services, transportation, etc. required for and reasonably incidental to the complete and satisfactory installation of all of the HVAC Systems as indicated on the Drawings or specified herein.

1.2 WORK INCLUDED IN THIS SECTION:

- A. Ceiling Exhaust Fans.
- B. Rooftop Exhaust Fans
- C. Louvers.
- D. Grilles, Registers and Diffusers.
- E. Duct Insulation.
- F. Vibration Isolation.
- G. Test and Balance.
- H. Submittals and Shop Drawings.
- I. Record Drawings.
- J. Operation and Maintenance Manuals.
- K. Guarantee.

1.3 RELATED WORK SPECIFIED ELSEWHERE

- A. Electrical supply to units. See Electrical Drawings.

1.4 GENERAL REQUIREMENTS

- A. This section of the specification shall be considered as a part of the entire specification and all applicable portions of General Conditions, Special Conditions, and Division 1 shall apply.
- B. Erection: The Contractor shall furnish the services of an experienced superintendent, who shall be constantly in charge of the erection of the work, together with all necessary journeymen, helpers, and laborers required to properly unload, erect, connect, adjust, start of operate and test the work involved.

1.5 REFERENCES

- A. AABC - National Standards for Field Measurement and Instrumentation, Total System Balance.
- B. AMCA 210 - Laboratory Methods of Testing Fans for Rating Purposes.
- C. AMCA 300 - Test code for sound rating air-moving devices.
- D. ANSI/NFPA 90A - Installation of Air Conditioning and Ventilation System.
- E. ARI 270 - Sound rating of Outdoor Unitary Equipment.
- F. ASHRAE 52-76 - Method of Testing Air Cleaning Devices Used in General Ventilation for Removing Particulate Matter.
- G. ASTM A90 - Weight of Coating on Zinc - Coated (Galvanized) Iron or Steel Articles.

- H. ASTM A120 - Black and Galvanized Steel Pipe.
- I. ASTM B88 - Seamless Copper Water Tube.
- J. ASTM C518 - Steady State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
- K. ASTM C553 - Mineral Fiber Blanket and Felt Insulation.
- L. ASTM C612 - Mineral Fiber Block and Board Thermal Insulation.
- M. ASTM E84 - Surface Burning Characteristics of Building Materials.
- N. ASTM E96 - Water vapor Transmission of Materials.
- O. NFPA 90B - Installation of Warm Air Heating and Air Conditioning Systems.
- P. NFPA 255 - Surface Burning Characteristics of Building Materials.
- Q. SMACNA - Low Pressure Duct Construction Standards.
- R. UL 181 - Factory Made Air Ducts and Connectors.
- S. UL 723 - Surface Burning Characteristics of Building Materials.
- T. California Mechanical Code - 2019 Edition.

1.6 SUBMITTALS AND SHOP DRAWINGS

- A. Contractor agrees that shop drawings submittals processed by the District do not become Contract Documents and are not Change Orders; that the purpose of the shop drawing review is to establish a reporting procedure and is intended for the Contractor's convenience in organizing his work and to permit the District to monitor the Contractor's progress and understanding of the design. The process of review of the Contractor's submittals is not of testing the District's perception. If deviations, discrepancies or conflicts between shop drawings submittals and the Contract Documents are discovered either prior to or after the shop drawing submittals are processed by the District, the Contractor agrees that the Contract Documents shall control and shall be followed.
- B. Prepare and furnish fully coordinated shop drawings showing ductwork and piping on separate drawings. The drawings shall be minimum 1/4" = 1'-0" scale and shall show dimensioning of piping and ductwork from gridlines, bottom of elevation marks for ductwork and piping and fittings, valves, dampers, devices, etc. with labels. In addition, coordinate with related work and reference on the same drawings major plumbing piping, structural steel, fire protection piping, conduit runs and cable trays. Review and sign these drawings to verify coordination of related equipment. Conflicts, which occur shall be brought to the attention of the District prior to issuance of the drawings.
- C. Materials and Equipment: As soon as possible and within 35 days after award of the contract, and before their purchase, the Contractor shall submit to the District seven bound booklets for approval containing a complete list of materials, specialties and equipment he is to furnish for the installation. Literature shall be standard manufacturer's catalog cuts and items to be installed shall be clearly indicated. All submittals shall be made at one time.
- D. Each item shall be identified by manufacturer, brand and trade name, number, size, rating and whatever other data is necessary to properly identify and check the materials and equipment. The words: "as specified" will not be considered sufficient identification.
- E. Accessories, controls, finish, etc., not submitted or identified with the submitted equipment shall be furnished and installed as specified.
- F. Shop drawings shall be approved only to extent of information indicated. Approval of an item of equipment shall not be construed to mean approval for components for that item for which Contractor has provided no information.

- G. Approval of shop drawings shall not relieve Contractor of responsibility for providing all controls, wiring, components, etc. which are shown or specified, or all additional controls, wiring, components, etc. required to provide complete and correctly operating mechanical systems.
- H. Submit product data for the following manufactured products, assemblies, personnel and testing agencies required for this project.
 - 1. Exhaust Fans.
 - 2. Diffusers, Registers and Grilles.
 - 3. Louvers.
 - 4. Controls.
 - 5. Insulation Materials.
 - 6. Vibration Isolation.
 - 7. Detailed procedures, agenda, sample report forms, and copy of AABC National Project Performance Guarantee.

1.7 SUBSTITUTIONS

- A. Should the Contractor desire to substitute any material, equipment or other items for those specified, he shall submit a complete list, including detailed equipment layouts and performance characteristics within 35 calendar days after the scheduled Start of Construction. Said data shall be submitted in 7 copies, assembled in individual brochures.
- B. The entire cost of all changes of any type due to substitution for materials specified shall be born by the Contractor at no extra cost to the District.
- C. Unsolicited and voluntary deducts, on the part of the Contractor for substituting unapproved systems and/or equipment, shall not be considered for the purpose of awarding the Contract.
- D. The contractor shall submit the amount of cost credit to the Contract in the event the proposed substitution is accepted.
- E. In all cases where substitutions are proposed after bids are received, the Contractor shall bear the cost of evaluation on the basis of 2-1/2 times technical salaries of engineering personnel involved.

1.8 AVAILABILITY OF SPECIFIED EQUIPMENT

- A. Verify prior to bidding that all specified equipment is available and can be obtained in time for installation during orderly and timely progress of the work.
- B. In the event that specified items will not be so available, notify the District prior to receipt of bids.
- C. Costs of delays because of non-availability of specified items, when such delays could have been avoided by proper investigation on the part of the Contractor, will be back-charged as necessary and shall not be born by the District.

1.9 RECORD DRAWINGS

- A. The contractor shall arrange and pay for one set of white prints of the HVAC drawings, which he shall alter in red to show all changes made to the original layout. These drawings shall be kept current.
- B. The contractor shall deliver these completed to the District when the job is finished and accepted prior to final payment.

1.10 OPERATION AND MAINTENANCE DATA

- A. Submit two sets prior to final inspection, bound in 8-1/2 x 11 inch text pages, binders with durable plastic covers. Prepare binder covers with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", and title of project. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
- B. Contents: Prepare a Table of Contents with each Product or system description identified.
 - 1. Part 1: Directory listing names, addresses, and telephone numbers of District, Contractor, Subcontractors, and major equipment suppliers.
 - 2. Part 2: Operation and maintenance instructions, arranged by system. Identify the following:
 - (a) Significant design criteria.
 - (b) List of equipment.
 - (c) Parts list for each component.
 - (d) Operating instructions.
 - (e) Maintenance instructions for equipment and systems.
 - (f) Maintenance instructions for special finishes, including recommended cleaning methods and materials and special precautions identifying detrimental agents.
- C. Submit one copy of completed volumes in final form 15 days prior to final inspection. This copy will be returned after final inspection, with District comments. Revise content of documents as required prior to final submittal.
- D. Submit final volumes (revised) within ten days after final inspection.

1.11 GUARANTEES

- A. The Contractor, in accepting this contract, binds himself to replace or repair at his own expense any defect in workmanship or material which may appear within a period of one year from the date of the final acceptance of the building, and to pay for all resulting damage which shall appear within the said period; provided always that the Contractor shall not be liable for anything attributable to acts of the agents of the District, or for ordinary wear. Also, given date of work performed by the Contractor be accepted as complete, he shall agree to correct any deficiencies or omissions in respect to the plans or specifications which may appear in the afore-mentioned twenty-four month period.
- B. The Contractor guarantees that all piping as provided in this specification will be free from all obstructions, and that all piping will be tight and drip free.
- C. All refrigerant compressors shall carry a five-year manufacturer's warranty.

1.12 LOCAL CONDITIONS

- A. The Contractor and trade submitting tenders on this work shall visit and will be deemed to have visited the site to ensure that they are familiar with all conditions relating to the work. Failure to visit the site will in no way relieve the successful Contractor of the necessity of furnishing any material or performing any work that may be required to complete the work in accordance with the drawings and specifications without additional cost to the District.

1.13 RULES, REGULATIONS AND CODES

- A. All work and materials shall be in full accordance with the latest California Mechanical Code, California Plumbing Code, California Building Code and local rules and regulations, State Fire Marshal regulations, the safety orders of the Division of Industrial Safety; the National Electric Code; the standards of the National Fire Protection Association; American Gas Association; Occupation and Safety Act; American National Standards Institute; American Society of Mechanical Engineers; American Society for Testing and Materials; Installation Standards published by the International Association of Plumbing And Mechanical officials (IAPMO) and other applicable laws, codes, or regulations. Nothing in these specifications shall be construed to permit work not conforming to these codes.
- B. Electrical Work: Motors, electrical apparatus and wiring specified in this section shall conform to the National Electrical Manufacturer's Standards and the National Electric Code and bear the Underwriter's label of approval.
- C. The Contractor shall furnish, without extra charge, any additional material and labor when and where required to comply with these rules and regulations, though the work be not mentioned in these Specifications or shown on the Drawings. When these Specifications or Drawings call for or describe materials or construction of a better quality or larger sizes than required by the above mentioned rules and regulations, the provisions of these specifications and accompanying drawings shall take precedence.

1.14 FEES AND PERMITS

- A. The Contractor must obtain and pay all fees for permits, licenses, inspections, etc., which are required by any legally constituted authority. Coordinate exact requirements with the District prior to bid.

1.15 COORDINATION

- A. Following the general arrangement indicated on the Drawings as closely as possible, the Contractor shall coordinate with the architectural, structural, plumbing, electrical and all other trades prior to installation of the materials and equipment to verify adequate space available for installation of the work shown. The District shall be immediately notified if an area of conflict occurs between trades.
- B. The Contractor shall bear all costs incurred for work that must be relocated due to conflicts between trades.
- C. The Mechanical Contractor shall coordinate all requirements for all points of connection with the General Contractor and other trades prior to bid.

1.16 DRAWINGS

- A. The work shall be installed as indicated on Drawings, however, changes to accommodate installation of this work with other work, or in order to meet Architectural or structural conditions, shall be made without additional cost to the District.
- B. For the purpose of clarity and legibility, the Drawings are essentially diagrammatic to the extent that many offsets, bonds, unions, special fittings and exact locations are not indicated. The Contractor shall make use of all data in all of the Contract Documents, and shall verify this information at the site.

1.17 INSPECTION

- A. The Contractor shall not allow or cause any of his work to be covered up or closed in until it has been inspected, tested, approved by all authorities have jurisdiction, and until Project Record drawings have been properly annotated.
- B. Should any of his work be covered up or closed in before such inspection, he shall, at his own expense, uncover the work to the satisfaction of the inspection party. All related repair work cost shall be borne by the Contractor.

1.18 DELIVERY, STORAGE AND PROTECTION OF PROPERTY

- A. Place orders for all equipment in time to prevent any delay in construction schedule or completion of project. If any materials or equipment are not ordered in time, additional charges made by equipment manufacturers to complete their equipment in time to meet construction schedule, together with any special handling charges, shall be borne by the contractor.
- B. Materials shall be delivered in ample quantities from time to time as may be necessary for the uninterrupted progress of the work. They shall be stored as to cause the least obstruction to the premises and distributed so as to prevent overloading to any portion of the structure.
- C. The Contractor shall provide temporary storage and shop areas that are required at the site for the safe and proper storage of materials, tools, and other items used in the performance of this work. These areas shall be constructed only in approved locations and shall not interfere with the work of any other Contractor.
- D. All work, equipment and materials shall be protected at all times. The Contractor shall make good all damage caused either directly or indirectly by his own workmen. The Contractor shall also protect his own work from damage. He shall close all pipe and duct openings with caps or plugs during installation. He shall protect all of his equipment and materials against dirt, water, chemical, and mechanical injury. Upon completion, all work shall be thoroughly cleaned and delivered in a new condition.

1.19 DAMAGE BY LEAKS, ETC.

- A. The Contractor shall be responsible for all damage to any part of the premises or work of other Contractors, caused by leaks or breaks in the piping or equipment furnished and/or installed under this section, during the construction and guarantee period.

1.20 ACCESS TO EQUIPMENT FOR MAINTENANCE

- A. Install all equipment, piping, etc. to permit access for normal maintenance. Maintain easy access to filters, motors, etc. Install all such equipment and accessories to facilitate maintenance. Perform any relocation of pipes, etc. required to permit access at request of District at no additional cost to District.
- B. Furnish and install access doors or panels in walls, floors, and ceilings to permit access to equipment, dampers, and all other items requiring service. Coordinate location of access doors with other trades as required.
- C. Size access panels to allow inspection and removal of all items served.
- D. Use Milcor style as required for material in which door is installed. Where door is installed in fire rated construction, provide door bearing UL label required for condition.

2. PART 2 – PRODUCTS

2.1 GENERAL

- A. All materials and equipment shall be new and of the best of their respective grades, free from all defects and of the make, brand or quality herein specified or as accepted by the District.
- B. All materials and equipment shall be identified by manufacturer's name or nameplate data. Unidentified material or equipment shall be removed from the site.
- C. Equipment specified by manufacturer's number shall include all accessories, controls, etc., listed in the catalog as standard with the equipment. Optional or additional accessories shall be furnished as specified.
- D. Where no specific make of material or equipment is mentioned, any first class product of a reputable manufacturer may be used, provided it conforms to the requirements of the system and meets with the approval of the District.
- E. Equipment and materials damaged during transportation, installation and operation shall be considered as "totally damaged" and shall be replaced with new. Any variance from this clause shall be made only with written approval of the District.

2.2 MANUFACTURER

- A. Split System Air Conditioners:
 - 1. Daikin.
 - 2. Carrier.
- B. Exhaust Fans:
 - 1. Cook.
 - 2. Greenheck.
 - 3. Penn.
- C. Ceiling Fans
 - 1. Big Ass Fans
 - 2. Or Approved Equal.
- D. Diffusers, registers, and grilles:
 - 1. Krueger.
 - 2. Titus.
 - 3. Price.
- E. Thermostats:
 - 1. Stand Alone Control – 7 Day Programmable with LCD Display, Push Button Override, Auto Change Over
- F. Vibration Isolation:
 - 1. Mason.
 - 2. M.W. Sausse’.
 - 3. Approved equal.

2.3 CEILING CABINET FANS

- A. Fan shall be ceiling mounted, direct driven, centrifugal exhaust fan.
- B. Fan shall be manufactured at an ISO 9001 certified facility. Fan shall be listed by Underwriters Laboratories (UL 705) and UL listed for Canada (cUL 705). Fan shall bear the AMCA Certified Ratings Seal for Sound and Air Performance.
- C. The fan wheel housing and integral outlet duct shall be injection molded from a specially engineered resin exceeding UL requirements for smoke and heat generation. The outlet duct shall have provision for an aluminum backdraft damper with continuous aluminum hinge rod. The inlet box shall be minimum 22 gauge galvanized steel. Motor shall be isolation mounted to a one piece galvanized stamped steel integral motor mount/inlet. A field wiring compartment with disconnect receptacle shall be standard. To accommodate different ceiling thickness, an adjustable pre-punched mounting bracket shall be provided. A white, high impact styrene injection molded grill shall be provided as standard. Unit shall be designed with provision for field conversion from ceiling to in-line. Unit shall be shipped in ISTA Certified Transit Tested Packaging.
- D. Wheel shall be centrifugal forward curved type, injection molded of polypropylene resin. Wheel shall be balanced in accordance with AMCA Standard 204-96, Balance Quality and Vibration Levels for Fans.

- E. Motor shall be open drip proof type with permanently lubricated bearings and include impedance or thermal overload protection and disconnect plug. Motor shall be furnished at the specified voltage.
- F. Provide Vibration Isolation hanger kit
- G. Provide wall discharge cap where indicated.
- H. Provide pitched roof curb with cant strip and rain cap where indicated.
- I. Provide electrical interlock with timeclock or light switch as specified. Coordinate with electrical contractor and provide all necessary starters, contacts, relays and switches necessary to complete interlock.

2.4 CEILING-MOUNTED CIRCULATION FANS

- A. The ceiling-mounted circulation fan shall be furnished with mounting hardware, a remote control, and SenseME Technology as manufactured by Haiku Home.
- B. Fan Assembly, as a system, shall be Intertek/ETL-certified and built pursuant to relevant safety standards as described above.
- C. The ceiling fan shall possess the Energy Star equipment designation.
- D. The Fan shall be provided with a universal mount suitable for flat or sloped ceilings with heights ranging from 8.5 – 18 ft.
- E. The fan shall be equipped with a mounting bracket, canopy, mounting ball and wedge, extension tubes, wiring cover, motor hub, and mounting hardware.
- F. Provide a 20-inch extension tube as part of the fan.
- G. The fan shall be equipped with three airfoils spanning a total diameter as indicated on plans.
- H. The fan shall have an electronically commutated motor rated for 100 – 240 VAC, single phase.
- I. The motor shall draw 1.41 – 52 watts depending on the speed at which the fan is operated.
- J. The fan shall be designed for continuous operation in ambient temperatures of 32 – 104 F.
- K. The fan motor unit and motor unit trim shall be coordinated with architect's final finishes.
- L. The fan shall be equipped with a safety cable that provides an additional means of securing the fan assembly to the building structure. The safety cable shall be 1.5 mm in diameter and fabricated of aircraft steel.
- M. Field construction of safety cables shall not be permitted.
- N. The fan shall be equipped with SenseMe Technology for smart automation, and shall be able to wirelessly connect to local ethernet networks or host a network. The fan's Wi-Fi capability shall permit over-the-air firmware updates.
- O. SenseMe Technology control features shall be managed by facility staff via the Haiku Mobile app.
- P. Contractor shall coordinate with the owner for the provision of a Haiku Account.
- Q. Ceiling fan shall be provided with motion sensor to enable the fan speed based on room occupancy.
- R. The fan shall be equipped with a compact IR remote control that allows intuitive operation of the fan.

2.5 DUCTWORK AND ACCESSORIES

- A. General: Non-combustible or conforming to requirements for Class 1 air duct materials, or UL 181.
- B. 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. Round duct shall be spiral seam construction.

- C. Flexible Ducts: Interlocking spiral of galvanized steel or aluminum construction; rated to (2 inches WG positive and 1.5 inches WG negative for low pressure ducts) (and 15 inches WG positive or negative for medium high pressure ducts.)
- D. Insulated Flexible Ducts: Flexible duct wrapped with flexible glass fiber insulation, enclosed by Pressure Ductwork: seamless aluminum pigmented plastic vapor barrier jacket; maximum 0.23 K value at 75 degrees F w/metal connectors.
- E. Fasteners: Rivets, bolts, or sheet metal screws.
- F. Sealant: Non-hardening, water resistant, fire resistive, compatible with mating materials; liquid used alone or with tape, or heavy mastic.
- G. Hanger Rod: Steel, galvanized; threaded both ends, threaded one end, or continuously threaded.
- H. Paint exposed surfaces, whether or not colors are designated in schedules, except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surface. If color or finish is not designated, the Owner's Representative is select from standard colors or finishes available. Painting includes field painting exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.
- I. Low Pressure Ducts:
 - 1. Fabricate and support in accordance with 2007 CMC, SMACNA Low Pressure Duct Construction Standards and ASHRAE handbooks, except as indicated. Gages for galvanized steel ducts for low pressure systems where velocities do not exceed 2000 FPM shall be as follows:

RECTANGULAR DUCT		ROUND DUCT	
<u>Dimension of Largest Side (L) in Inches</u>	<u>Gage</u>	<u>Diameter (D) In Inches</u>	<u>Ga.</u>
L≤12	26	D<9	26
12<L≤30	24	9≤D<14	24
30<L≤54	22	14≤D<23	22
54<L≤84	20	23≤D<37	20
84<L	18	37≤D<51	18
		51≤D<61	16
		61≤D<84	14

All joint and seam constructions as indicated in the CMC are acceptable.

- 2. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts. No variation of duct configuration or sizes permitted except by written permission.
- 3. 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 turning vanes.
- 4. 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.
- 5. Use double nuts and lock washers on threaded rod supports.

- J. Volume Control Dampers:
1. Fabricate in accordance with SMACNA Low Pressure Duct Construction Standards, and as indicated.
 2. Opposed blade dampers shall have factory-fabricated blades, with factory assembled linkages, mounted in frames. Blades shall have interlocking edges and ends. Rectangular dampers 6" or more wide, shall be the multi-blade type. Blades on multi-blade type dampers must not be over 6" wide. Dampers shall be of the opposed blade type. Dampers shall have bar or channel frames and corner bracing. All blade and linkage bearings shall be self lubricating plastic. Damper assembly leakage not to exceed 1% with 4.0 W.C. static pressure.
 3. Provide locking, indicating quadrant regulators on single and multi-blade dampers.
 4. On insulated ducts mount quadrant regulators on stand-off mounting brackets, bases, or adapters.
- K. Duct Test Holes:
1. Cut or drill temporary test holes in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.
- L. Diffusers, Supply Registers, Return Registers, and Exhaust Grilles:
1. Fabricate of steel with steel or aluminum frame and baked enamel off-white finish.
 2. Provide opposed blade damper and multi-louvered equalizing grid with damper adjustable from diffuser face as indicated on the drawings.
 3. Ceiling Supply Diffusers (SD): Krueger Model 124O or approved equal, with 4-way throw, with balancing damper, or approved equal.
 4. Exposed Round Supply Diffuser (SD): Krueger Model RA-2 concentric round or approved equal, with adjustable throw, with volume damper.
 5. Wall Supply Register (SR) and Wall or Ceiling Exhaust or Return grille (EG) or (RG): Krueger Type 88OH double deflection type and S8OH fixed bar-type or approved equal. Constructed of steel with opposed blade damper.
 6. Heavy Duty Wall Return or Exhaust Register (RG) or (EG): Krueger Type 480H Heavy Duty fixed blade or approved equal. Provide opposed blade damper as required.

2.6 CONTROLS

- A. The Mechanical Contractor shall be responsible for the proper coordination of all control work and electrical work in connection therewith. He shall also be responsible for the proper operation of the entire system.
- B. The Electrical Contractor shall furnish and install all line voltage control wiring, and in all conduit. Wire sizing and length of run shall be coordinated with the manufacturer and Electrical Engineer. All EMS controls, wiring, and conduit shall be by EMS contractor.
- C. Electrical Work: All electric relays, hand-off automatic switches and all electrical wiring and all conduit will be provided under the Electrical Section, except as otherwise specified. Furnish and install additional conduit, wiring, relays, hand-off automatic switches made necessary by the use of approved substituted equipment under this Section with no additional cost to the Owner.
- D. Refer to drawings for control diagrams and additional requirements.
- E. Where stand-alone controls are indicated, mechanical contractor shall be responsible for low voltage controls conduit, wiring, and thermostat.

2.7 INSULATION

A. General:

1. All insulation shall have composite (insulation, jacket or facing, and adhesive used to adhere the facing or jacket to the insulation) fire smoke hazard ratings as tested by procedure ASTM E84, NFPA 255 and UL 723 not exceeding:
 - (a) Flame Spread: 25
 - (b) Smoke Developed: 50
2. All products or their shipping cartons shall bear a label indicating that flame and smoke ratings do not exceed above requirements. Any treatment of jackets or facings to impart flame and smoke safety shall meet the above requirements.
3. The Contractor shall certify that all products used have met the above criteria.
4. The insulation values shown are a minimum. If the requirements of Title 24 exceed these values, the amount of and/or type must be increased to meet the Title 24 requirements.

B. Duct Insulation:

1. Fiberglass Duct Wrap:
 - (a) Insulation: ASTM C553; flexible, noncombustible blanket.
 - (1) 'K' value: ASTM C518, 0.48 at 75 degrees F.
 - (2) Maximum service temperature: 250 degrees F.
 - (3) Density: 0.75 lb/ ft3.
 - (b) Vapor Barrier Jacket:
 - (1) Kraft paper reinforced with glass fiber yarn and bonded to aluminized film vinyl.
 - (2) Moisture vapor transmission: ASTM E96; 0.5 perm.
 - (3) Secure with pressure sensitive tape.
 - (c) Vapor Barrier Tape: Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.
 - (d) Tile Wire: Annealed steel, 16 gage.
2. Glass Fiber Duct Liner, Flexible:
 - (a) Insulation: ASTM C553; flexible, noncombustible blanket.
 - (1) 'K' value: ASTM C518, 0.24 at 75 degrees F.
 - (2) Maximum service temperature: 250 degrees F.
 - (3) Density: 1.5 to 3.0 lb/ft3.
 - (4) Maximum Velocity on Coated Air Side: 4,000 ft/min.
 - (b) Adhesive: Waterproof (fire-retardant) type.
 - (c) Liner Fasteners: Galvanized steel, self-adhesive pad.

3. Glass Fiber Duct Liner, Rigid:
 - (a) Insulation: ASTM C612; semi-rigid, noncombustible.
 - (1) 'K' value: ASTM C518, 0.24 at 75 degrees F.
 - (2) Maximum service temperature: 250 degrees F.
 - (3) Density: 1.5 to 3.0 lb/cu ft.
 - (4) Maximum Velocity on Coated Air Side: 4,000.
 - (b) Adhesive: Waterproof (fire-retardant) type.

3. PART 3 - EXECUTION

3.1 GENERAL

- A. Install all equipment in locations indicated on the Drawings. Contractor will be responsible to verify with the District, if suitability is doubted. Contractor shall notify the District before installation into any apparent improper locations of interference with other work such as electrical outlets, windows, cabinetwork or other features.

3.2 INSTALLATION

- A. Roof-top equipment: Install in accordance with manufacturer's instructions. Mount units on factory built roof-mounting frame providing watertight enclosure to protect ductwork and utility services, or on platforms. Install roof mounting frame level.
- B. Install ceiling-mounted circulation fans in accordance with the manufacturer's installation guide, which includes acceptable mounting methods.
- C. Ductwork and Accessories:
 1. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide pilot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.
 2. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
 3. Install accessories in accordance with manufacturer's instructions and to meet the provisions of SMACNA "Seismic Restraint Manual: Guidelines For Mechanical Systems," Latest Edition.
 4. Provide balancing dampers at points on low-pressure supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing. Use splitter dampers only where indicated.
 5. Provide flexible connections immediately adjacent to equipment in ducts associated with fans and motorized equipment.
 6. 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 12 x 12 inch size for hand access, 30 x 30 inch size for shoulder access, and as indicated.
 7. Provide duct test holes where indicated and required for testing and balancing purposes.
 8. Check location of outlets and inlets and make necessary adjustments in position to conform to Architectural features, symmetry, and lighting arrangement.
 9. Install diffusers to ductwork with airtight connection.

10. Provide balancing dampers on duct take-off to diffusers and registers, regardless of whether dampers are specified as part of the diffuser, or register assembly.
 11. Paint ductwork visible behind air outlets and inlets matte black.
- D. Thermostats and over-ride switches: Install at 48" above finished floor to top of thermostat unless otherwise stated. Coordinate with other trades.
- E. Insulation:
1. Duct Insulation:
 - (a) Unless specifically indicated on the drawings the Contractor may line or wrap ductwork to meet insulation requirements.
 - (b) Fiberglass ductwrap:
 - (1) Secure insulation with vapor barrier with wires and seal jacket joints with vapor barrier adhesive or tape to match jacket.
 - (2) Secure insulation without vapor barrier with staples, tape, or wires.
 - (3) Install without sag on underside of ductwork. Use adhesive or mechanical fasteners where necessary to prevent sagging. Lift ductwork off trapeze hangers and insert spacers.
 - (4) Seal vapor barrier penetrations by mechanical fasteners with vapor barrier adhesive.
 - (5) Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.
 - (c) Duct (and Plenum) liner Application:
 - (1) Install as indicated (sound lining) on the drawings.
 - (2) Adhere insulation with adhesive for 100 percent coverage. Secure insulation with mechanical liner fasteners. Refer to SMACNA Standards for spacing. Seal and smooth joints. Seal liner surface penetrations with adhesive.
 - (3) Duct dimensions indicated are net inside dimensions required for airflow. Increase duct size to allow for insulation thickness.

3.3 DUCT CLEANING

- A. See section 23 01 30.5

3.4 AIR SYSTEM TEST AND BALANCE

- A. Perform all tests to the entire satisfaction of the District. Air balancing contractor shall notify district one week prior to scheduling air balance at the site.
- B. Regulating and Adjusting Air Systems:
1. The Contractor shall have an experienced independent testing company certified member of the Associated Air Balance Council (A.A.B.C.) specializing in air conditioning system testing completely balance the air systems so that the volume of air indicated on the drawings is being delivered to the outlets. He shall adjust and re-adjust this part of the work until the operation complies with the requirements of the drawings and specifications.
 2. Testing Procedure: Procedures shall conform to A.A.B.C. standards. Provide reports in sort cover, letter size, 3-ring binder manuals, complete with index page and indexing tabs, with cover identification at front and side. Include set of reduced drawings with air outlets and equipment identified to correspond with data sheets, and indicating thermostat locations.

3. The following test data shall be taken and three (3) copies submitted in tabulated form to the Architect for each system:
 - (a) Test and adjust all supply, return & exhaust blower RPM to design requirements.
 - (b) Test and record all motor full load amperes.
 - (c) Test and record system static pressures, suction and discharge.
 - (d) Test and adjust system for design re-circulated air, CFM.
 - (e) Test and adjust system for design CFM outside air.
 - (f) Adjust all supply, return and exhaust outlets to within 5% of design CFM.

3.5 SOUND AND VIBRATION ISOLATION

- A. All vibrating equipment shall be sound isolated from the structure.
- B. The Contractor shall submit all necessary data for each vibration isolator, including static deflection and weight loading, for equipment in operation.
- C. All vibrating equipment shall be provided with flexible pipe connections. Submit for approval prior to installation.

END OF SECTION

SECTION 31 11 00

CLEARING AND GRUBBING

PART 1 - GENERAL

1.01 SUMMARY

- A. Clearing vegetation, debris, trash and other materials within limits indicated.
- B. Grubbing of vegetation within limits indicated.

1.02 RELATED DOCUMENTS

- A. Caltrans Standard Specifications.
 - 1. Section 17-2, Clearing and Grubbing.
- B. California Building Code: Chapter 33 – Site Work, Demolition and Construction.

PART 2 - PRODUCTS

2.01 NOT USED

PART 3 - EXECUTION

3.01 PREPARATION

- A. Locate and clearly flag vegetation to remain or to be relocated.

3.02 RESTORATION

- A. Repair or replace vegetation indicated to remain that is damaged by construction operations, as directed by the Owner.
- B. Employ a qualified arborist, licensed in jurisdiction where the Project is located, to submit details of proposed repairs and to repair damage to shrubs.

3.03 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction. Removal includes digging out stumps and obstructions and grubbing roots.
- B. Remove trash, debris, logs, concrete, masonry and other waste materials.
- C. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
- D. Completely remove stumps, roots, obstructions, and debris extending to a depth of 18-inches below subgrade.
- E. Use only hand methods for grubbing within drip line of remaining trees.

END OF SECTION

SECTION 31 23 33

TRENCHING AND BACKFILL

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Excavation, bedding, and backfill for underground storm drain, sanitary sewer, and water piping and associated structures.

1.02 SECTION EXCLUDES

- A. Drainage fill material and placement around subdrains.
- B. Trenching and backfill for other utilities such as underground HVAC piping, electrical conduit, telephone conduit, gas piping, cable TV conduit, etc.

1.03 RELATED DOCUMENTS

A. ASTM:

1. C 33, Standard Specification for Concrete Aggregates.
2. C 150, Standard Specification for Portland Cement.
3. C 260, Standard Specification for Air-Entraining Admixtures for Concrete.
4. C 618, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
5. D 1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
6. D 2321, Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
7. D 2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
8. D 3740, Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
9. E 329, Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
10. E 548, Guide for General Criteria Used for Evaluating Laboratory Competence.

B. California Code of Regulation Title 24, Part 2, California Building Code:

1. Chapter 11B – Accessibility to Public Buildings.
2. Chapter 33 – Safeguards During Construction.

C. Caltrans Standard Specifications:

1. Section 19, Earthwork.
2. Section 26, Aggregate Bases.
3. Section 68, Subsurface Drains.
4. Section 96, Geosynthetics.

D. CAL/OSHA, Title 8.

1.04 DEFINITIONS

- A. AC: Asphalt Concrete.
- B. ASTM: American Society for Testing and Materials.
- C. Bedding: Material from bottom of trench to bottom of pipe.
- D. CDF: Controlled Density Fill.
- E. DIP: Ductile Iron Pipe.
- F. Initial Backfill: Material from bottom of pipe to 12-inches above top of pipe.
- G. PCC: Portland Cement Concrete.
- H. RCP: Reinforced Concrete Pipe.
- I. Springline of Pipe: Imaginary line on surface of pipe at a vertical distance of $\frac{1}{2}$ the outside diameter measured from the top or bottom of the pipe.
- J. Subsequent Backfill: Material from 12-inches above top of pipe to subgrade of surface material or subgrade of surface facility or to finish grade.
- K. Trench Excavation: Removal of material encountered above subgrade elevations and within horizontal trench dimensions.
 - 1. Authorized Trench Over-Excavation: Excavation below trench subgrade elevations or beyond indicated horizontal trench dimensions as shown on plans.
 - 2. Unauthorized Trench Over-Excavation: Excavation below trench subgrade elevations or beyond indicated horizontal trench dimensions. Unauthorized excavation shall be without additional compensation.
- L. Utility Structures:
 - 1. Storm drainage manholes, catch basins, drop inlets, curb inlets, vaults, etc.
 - 2. Sanitary sewer manholes, vaults, etc.
 - 3. Water vaults, etc.

1.05 SUBMITTALS

- A. Follow submittal procedures outlined in Section 01 33 00 – Submittal Procedures.
- B. Product Data:
 - 1. Grading and quality characteristics showing compliance with requirements for the Work.
 - 2. Certify that material meets requirements of the Project.
- C. Samples:
 - 1. If required, provide 40-pound samples of all imported trench bedding and backfill material sealed in airtight containers, tagged with source locations and suppliers of each proposed material.
 - 2. Provide materials from same source throughout work. Change of source requires approval of the Owner.

1.06 QUALITY ASSURANCE

- A. Conform all work to the appropriate portion(s) of the Caltrans Standard Specifications, Section 19.
- B. Percentage of compaction specified shall be the minimum acceptable. The percentage represents the ratio of the dry density of the compacted material to the maximum dry density of the material as determined by the procedure set forth in ASTM D 1557.
- C. Conform work to the requirements of the California Building Code.
 - 1. Section 1809A.14 – Pipe and Trenches.

1.07 PROJECT CONDITIONS

- A. Promptly notify the Owner of surface or subsurface conditions differing from those disclosed in the construction documents. First notify the Owner verbally to permit verification and extent of condition and then in writing. No claim for conditions differing from those anticipated in the Contract Documents will be allowed unless Contractor has notified the Owner in writing of differing conditions prior to contractor starting work on affected items.
- B. Protect open, trenches, and utility structure excavations with fences, covers and railings to maintain safe pedestrian and vehicular traffic passage.
- C. Stockpile on-site and imported backfill material temporarily in an orderly and safe manner.
- D. Provide dust and noise control in conformance with Division 1 General Requirements for Cleaning and Waste Management.

PART 2 - PRODUCTS

2.01 PIPE BEDDING AND INITIAL BACKFILL

- A. ASTM D 2321, Class IA, IB or II.
 - 1. Clean and free of clay, silt or organic matter.
- B. Permeable Material: Conform to Section 68-2.02F(3) of Caltrans Standard Specifications, Class 2 permeable.
- C. Class 2 Aggregate Base: Conform to Section 26 of Caltrans Standard Specifications, ¾-inch maximum. Material shall also be non-expansive and predominantly granular soil or soil-rock mixture "(percent of passing #200: 50 maximum, 5 minimum)" with plasticity index of 15 or less.
- D. Sand: Conform to Section 19-3.02F(2) of Caltrans Standard Specifications.

2.02 WARNING TAPE

- A. See Section 33 10 00 – Water Utilities.

2.03 SUBSEQUENT BACKFILL

- A. Conform to on-site or imported structural backfill in Section 31 23 00 – Excavation and Fill.

2.04 CONTROLLED DENSITY FILL (CDF) (IN TRENCHES)

- A. Provide non-structural CDF, from bottom of trench to finish subgrade of subbase or base material, that can be excavated by hand and produce unconfined compressive 28-day strengths from 50-psi to a maximum of 150-psi. Provide aggregate no larger than 3/8-inch top size. The 3/8-inch aggregate shall not comprise more than 30% of the total aggregate content.
- B. Cement: Conform to the standards as set forth in ASTM C-150, Type II Cement.
- C. Fly Ash: Conform to the standards as set forth in ASTM C-618, for Class F pozzolan. Do not inhibit the entrainment of air with the fly ash.
- D. Air Entraining Agent: Conform to the standards as set forth in ASTM C-260.

- E. Aggregates need not meet the standards as set forth in ASTM C-33. Any aggregate, producing performances characteristics described herein will be accepted for consideration. The amount of material passing a #200 sieve shall not exceed 12% and no plastic fines shall be present.
- F. Provide CDF that is a mixture of cement, Class F pozzolan, aggregate, air entraining agent and water. CDF shall be batched by a ready mixed concrete plant and delivered to the job site by means of transit mixing trucks.
- G. The Contractor shall determine the actual mix proportions of the controlled density fill to meet job site conditions, minimum and maximum strengths, and unit weight. Entrained air content shall be a minimum of 4.0%. The actual entrained air content shall be established for each job with the materials and aggregates to be used to meet the placing and unit weight requirements. Entrained air content may be as high as 20% for fluidity requirements.

2.05 CONCRETE STRUCTURE BEDDING AND BACKFILL

- A. Precast Structures: Same materials to the same heights as specified for pipe bedding and backfill.
- B. Poured-in-Place Structures:
 - 1. Bedding: In general, bedding is not required, pour bases against undisturbed native earth in cut areas and against engineered fill compacted to 90% relative compaction in embankment areas.
 - 2. Side Backfill: On-site or imported structural fill meeting the requirements given in Section 31 23 00 – Excavation and Fill.

2.06 FILTER FABRIC

- A. Filter Fabric:
 - 1. Filter Fabric: Section 96-1.02B of Caltrans Standard Specifications.
 - 2. Mirafi 140N (Mirafi Inc., Charlotte, NC) (Tel. 800-438-1855) or equal.

PART 3 - EXECUTION

3.01 TRENCHING AND EXCAVATION

- A. Existing PCC or AC Areas: Cut PCC or AC to full depth at a minimum distance of 12-inches beyond the edge of the trench.
- B. Excavate by hand or machine. For gravity systems begin excavation at the outlet end and proceed upstream. Excavate sides of the trench parallel and equal distant from the centerline of the pipe. Hand trim excavation. Remove loose matter.
- C. Excavation Depth for Bedding: Minimum of 4-inches below bottom, except that bedding is not required for nominal pipe diameters of 2-inches or less.
- D. Excavation Width at Springline of Pipe:
 - 1. Up to a nominal pipe diameter of 24-inches: Minimum of twice the outside pipe diameter.
 - 2. Nominal pipe diameter of 30-inches through 36-inches: Minimum of the outside pipe diameter plus 2-feet.
 - 3. Nominal pipe diameter of 42-inches through 60-inches: Minimum of the outside pipe diameter plus 3-feet.
- E. Over-Excavations: Backfill trenches that have been excavated below bedding design subgrade, with approved bedding material.
- F. Comply with the Owner's limitations on the amount of trench that is opened or partially opened at any one time. Do not leave trenches open overnight without the approval of the Owner.

- G. Where forming is required, excavate only as much material as necessary to permit placing and removal of forms.
- H. Grade bottom of trench to provide uniform thickness of bedding material and to provide uniform bearing and support for pipe along entire length. Remove stones to avoid point bearing.

3.02 CONTROL OF WATER AND DEWATERING

- A. Be solely responsible for dewatering trenches and excavations and subsequent control of ground and surface water. Provide and maintain such pumps or other equipment as may be necessary to control ground water.
- B. Dewater during backfilling operation so that groundwater is maintained a least one foot below level of compaction effort.
- C. Reroute surface water runoff away from open trenches and excavations. Do not allow water to accumulate in trenches and excavations.
- D. Maintain dewatering system in place until dewatering is no longer required.

3.03 BRACING AND SHORING

- A. Conform to California and Federal OSHA requirements.
- B. Place and maintain such bracing and shoring as may be required to support the sides of the excavations for the proper protection of workmen; to facilitate the work; to prevent damage to the pipes and appurtenances being constructed; and to prevent damage to adjacent structures or facilities. Remove all bracing and shoring upon completion of the work.
- C. Be solely responsible for all bracing and shoring and, if requested by the Owner, submit details and calculations to the Owner. The Owner may forward the submittal to the Consulting Engineer and/or the California Division of Industrial Safety for their review. The Contractor's submittal shall include the basic design, assumed soils conditions and estimation of forces to be resisted, together with plans and specifications of the materials and methods to be used, and shall be prepared by a civil engineer or structural engineer registered in California. No excavations in trench section or around structures shall precede a response to the submittal by the Owner.
- D. Be solely responsible for installing and extracting the sheathing in a manner which will not disturb the line, grade, or backfill compaction or operation of the utility being installed or adjacent utilities and facilities.

3.04 PIPE BEDDING

- A. Accurately shape bedding material to the line and grade called for on the Plans. Carefully place and compact bedding material to the elevation of the bottom of the pipe in layers not exceeding 8-inches in loose thickness. Compact bedding material at optimum water content to 95% relative compaction unless specified otherwise on the. Compact by pneumatic tampers or other mechanical means. Jetting or ponding of bedding material will not be permitted.

3.05 WARNING TAPE

- A. Install in accordance with Section 33 10 00 – Water Utilities.

3.06 BACKFILLING

- A. Bring initial backfill up simultaneously on both sides of the pipe, so as to prevent any displacement of the pipe from its true alignment. Carefully place and compact initial backfill material to an elevation of 12-inches above the top of the pipe in layers not exceeding 8-inches in loose thickness. Compact bedding material at optimum water content to 90% relative compaction unless specified otherwise on the. Compact by pneumatic tampers or other mechanical means. Jetting or ponding of initial backfill material will not be permitted.
- B. Bring subsequent backfill to subgrade or finish grade as indicated. Carefully place and compact subsequent backfill material to the proper elevation in layers not exceeding 8-inches in loose thickness. Compact bedding material at optimum water content to 90% relative compaction, unless specified otherwise on the Plans. Compact by pneumatic tampers or other mechanical means. Jetting or ponding of subsequent backfill material will not be permitted.

- C. Do not use compaction equipment or methods that produce horizontal or vertical earth pressures that may cause excessive pipe displacement or damage the pipe.

3.07 CLEANUP

- A. Upon completion of utility earthwork all lines, manholes catch basins, inlets, water meter boxes and other structures shall be thoroughly cleaned of dirt, rubbish, debris and obstructions of any kind to the satisfaction of the Owner.
- B. See Section 01 74 00 – Refer to Division 1 General Requirements for Cleaning and Waste Management for further cleanup requirements.

END OF SECTION

SECTION 32 05 23

CONCRETE FOR EXTERIOR IMPROVEMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Materials for portland cement concrete.
- B. Aggregate and aggregate grading for portland cement concrete.
- C. Water for portland cement concrete.
- D. Admixtures for portland cement concrete.
- E. Proportioning for portland cement concrete.
- F. Mixing and transporting portland cement concrete.
- G. Formwork for cast in place portland cement concrete.
- H. Embedded materials for portland cement concrete.
- I. Steel reinforcement for portland cement concrete.
- J. Placing and finishing portland cement concrete.
- K. Curing portland cement concrete.
- L. Protecting portland cement concrete.

1.02 RELATED DOCUMENTS

- A. ASTM Standards
 - 1. A 1064, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
 - 2. A 615, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 - 3. C 94, Standard Specification for Ready-Mixed Concrete.
 - 4. C 114, Standard Test Methods for Chemical Analysis of Hydraulic Cement.
 - 5. C 150, Standard Specification for Portland Cement.
 - 6. C 618, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 - 7. D 1751, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruded and Resilient Bituminous Types).
- B. Caltrans Standard Specifications:
 - 1. Section 51: Concrete Structures.
 - 2. Section 73: Concrete Curbs and Sidewalks.
 - 3. Section 90-1: General section of Concrete section.
- C. California Building Code:
 - 1. Chapter 11B – Accessibility To Public Buildings, Public Accommodations, Commercial Buildings and Public Housing.
 - 2. Chapter 19A – Concrete.
 - 3. Chapter 33 – Safeguards During Construction.

1.03 DEFINITIONS

- A. ASTM: American Society for Testing and Materials.

1.04 SUBMITTALS

- A. Follow submittal procedures outlined in Section 01 33 00 – Submittal Procedures.
- B. Design Mixes: Have all concrete mixes designed by a testing laboratory and approved by the Consulting Engineer. Conform all mixes to the applicable building code requirement, regardless of other minimum requirements listed herein or on the drawings. Submit mix designs for review before use. Show proportions and specific gravities of cement, fine and coarse aggregate, and water and gradation of combined aggregates.
- C. Reinforcing Steel Shop-Drawings

1.05 QUALITY ASSURANCE

- A. Concrete shall be subject to quality assurance in accordance with Section 90 of the Standard Specifications.
 - 1. Slump tests: Have available, at job site, equipment required to perform slump tests. Make one slump test for each cylinder sample, from same concrete batch. Allowable maximum slump shall be 4 inches for walls and 3 inches for slabs on grade and other work.
- B. Certifications:
 - 1. Provide Owner's Representative at the time of delivery with certificates of compliance signed by both Contractor and Supplier containing the following statements:
 - 2. Materials contained comply with the requirements of the Contract Documents in all respects.
 - 3. Proportions and mixing comply with the design mix approved by the Consulting Engineer. Design mix shall have been field tested in accordance with the herein requirements of the Caltrans Standard Specifications and produces the required compressive strength under like conditions.
 - 4. Statement of type and amount of any admixtures.
 - 5. Provide Owner's Representative, at time of delivery, with certified delivery ticket stating volume of concrete delivered and time of mixing, or time of load-out in case of transit mixers.
- C. Conform to the applicable provisions of Section 51, 73 and 90 of the Caltrans Standard Specification and these Technical Specifications.
 - 1. Conform construction of portland cement concrete surface improvements (including curbs, gutters, medians, valley gutters, walks) to the requirements of Section 73 of the Caltrans Standard Specifications unless otherwise required in these Technical Specifications or shown on the Plans.
 - 2. Construct "V" ditches in accordance with Section 72-5.03 of the Standard Specifications; except that finishing shall be in accordance with Standard Specification Section 73 instead of 53, or as otherwise required in these Technical Specifications or shown on the Plans.
 - 3. Conform other construction of portland cement concrete items to the requirements of Section 51 of the Caltrans Standard Specifications unless otherwise required in these Technical Specifications or shown on the Plans.
- D. Conform to the requirements of the California Building Code section 1929A.2 for testing of reinforcing bars.

1.06 DESIGNATION

- A. General: Whenever the 28-day compressive strength is designated herein or on the plans is greater than 3,600 psi, the concrete shall be considered to be designated by compressive strength. The 28-day compressive strength shown herein or on the plans which are 3,600 psi or less are shown for design information only and are not considered a requirement for acceptance of the concrete. Whenever the concrete is designated by class or as minor concrete herein or on the plans, the concrete shall contain the cement per cubic meter shown in section 90-1.01 of the Caltrans Standard Specifications.
- B. Unless specified otherwise herein or on the Plans, Portland Cement Concrete for this Project shall be Class "2" as specified in Section 90-1.01 of the Caltrans Standard Specifications.

PART 2 - PRODUCTS

2.01 PORTLAND CEMENT

- A. General: Type V or type II (modified) cement conforming to the requirements of ASTM C 150, with the following modifications:
1. Cement shall not contain more than 0.60% by weight of alkalis, calculated as the percentage of Na_2O plus 0.658 times the percentage of K_2O when determined by either 4 intensity flame photometry or by the atomic absorption method. The instrument and procedure used shall be qualified as to precision and accuracy in accordance with the requirements of ASTM C 114.
 2. The autoclave expansion shall not exceed 0.50%.
 3. Mortar containing the Portland Cement to be used and the sand, when tested in accordance with Test Method No. Calif. 527, shall not expand in water more than 0.010% and shall have an air content less than .048%.
 4. Allowable tri-calcium Aluminate (C_3A) by weight shall not exceed 5%. Allowable tetracalcium aluminoferrite plus twice the tricalcium aluminate ($\text{C}_4\text{AF}+2\text{C}_3\text{A}$) by weight shall not exceed 25%. The sulfate expansion test (ASTM C 452) may be used in lieu of the above chemical requirements, provided the sulfate expansion does not exceed 0.040% at 14 days (max.).
 5. Contractor may substitute pozzolan for Portland Cement in amounts up to 15% of the required mix unless high early strength concrete is specified. Pozzolan shall consist of Class F Fly Ash meeting the requirements of ASTM C 618.
- B. Cement for Surface Improvements: Provide a coloring equivalent to ¼ pound of lampblack per cubic yard. Add to the concrete at the central mixing plant.
- C. Liquiblack, as supplied by Concrete Corporation of Redwood City, California, may be used in lieu of lampblack. One pint of liquiblack shall be considered equal to one pound of lampblack.

2.02 AGGREGATE AND AGGREGATE GRADING

- A. General: Conform to the requirements of Section 90-1.02C(1), 1.02C(2) and 1.02C(3) of the Caltrans Standard Specifications.
- B. Aggregate Size and Gradation: Conform to the requirements of section 90-3 of the Caltrans Standard Specifications for 25-mm (1-inch) maximum combined aggregate.

2.03 WATER

- A. General: Conform to the requirements of section 90-1.02D of the Caltrans Standard Specifications, for mixing and curing portland cement concrete and for washing aggregates.

2.04 CLASSIFICATION OF PORTLAND CEMENT CONCRETE

- A. Concrete for the following items shall be designated by the following classes per Section 90-1.01 of the Caltrans Standard Specifications:
1. Vehicular Pavement: Class 2.
 2. Curbs, Gutters, and Sidewalks: Minor Concrete.
 3. Cast in place Concrete Pipe: The concrete shall consist of a minimum of 564 pounds of Portland cement per cubic yard of concrete.
 4. Thrust Blocks: The concrete shall have a minimum compressive strength of 3,000 psi.
 5. Sign and Fence Footings: The concrete shall consist of a minimum of 376 pounds of Portland cement per cubic yard of concrete.
 6. Water, Storm, and Sanitary Structures: The concrete shall consist of a minimum of 564 pounds of Portland cement per cubic yard of concrete.

2.05 EXPANSION JOINT MATERIAL

- A. Material for expansion joints in portland cement concrete improvements shall be premolded expansion joint fillers conforming to the requirements of ASTM Designation D 1751. Expansion joint material shall be shaped to fit the cross section of the concrete prior to being placed. Suppliers certificates showing conformance with this specification shall be delivered with each shipment of materials delivered to the job site. Unless noted otherwise herein or on the Plans expansion joint thickness shall be as follows:
 - 1. Curbs, Curb Ramps, Island Paving, Sidewalks, Driveways and Gutter Depressions: ¼-inch.
 - 2. Concrete Slope Protection, Gutter Lining, Ditch Lining and Channel Lining: ½-inch.
 - 3. Structures: As indicated.

2.06 REINFORCEMENT AND DOWELS

- A. Bar reinforcement for concrete improvements shall be deformed steel bars of the size or sizes called for on the plans conforming to the requirements of ASTM Designation A 615 for Grade 60 bars. Size and shape for bar reinforcement shall conform to the details shown or called for on the Plans. Substitution of wire mesh reinforcement for reinforcing bars will not be allowed.
- B. Slip dowels, where noted or called for on the plans or detail drawings shall be smooth billet-steel bars as designated and conforming to the requirements of ASTM Designation A 615 for Grade 60 bars. Ends of bars inserted in new work shall be covered with a cardboard tube sealed with cork; no grease or oil shall be used.
- C. Mesh for reinforcement for concrete improvements shall be cold drawn steel wire mesh of the size and spacing called for on the plans conforming to the requirements of ASTM Designation A 1064 for the material and mesh. Size and extent of mesh reinforcement shall conform to the details shown or called for on the plans.
- D. Tie wire for reinforcement shall be eighteen (18) gauge or heavier, black, annealed conforming to the requirements of ASTM Designation A 1064.
- E. Suppliers certificates showing conformance with this specification shall be delivered with each shipment of materials delivered to the job site.

2.07 COLOR AND PATTERN FOR DECORATIVE SURFACES

- A. Colors for decorative surfacing shall be CHROMIX admixtures as manufactured by the L. M. Scofield Company, Schedule A-312.05 or approved equal. The specific color shall be as designated or called for on the Plans.
- B. Patterns for decorative surfacing shall be standard "Bomanite" patterns as copyrighted by the Bomanite Corporation of Palo Alto, California or equal. The specific pattern shall be as designated or called for on the Plans.

2.08 ACCESSORY MATERIALS

- A. Conform water stops and other items required to be embedded in of Portland Cement Concrete structures to the applicable requirements of Section 51 of the Caltrans Standard Specifications unless otherwise specifically noted or called for on the Plans or detail drawings.
- B. Curing Compounds:
 - 1. Regular Portland Cement Concrete: "Non-Pigmented Curing Compound - chlorinated Rubber Base-Clear" conforming to the requirements contained in Section 90-1.03B(3), of the Caltrans Standard Specifications.
 - 2. Color Conditioned Decorative Portland Cement Concrete: LITHOCHROME colorwax as manufactured by the L. M. Scofield Company or approved equal.

2.09 FORMS

- A. Conform to the requirements of Section 51-1.03C(2) of the Caltrans Standard Specifications.

2.10 PRECAST CONCRETE STRUCTURES

- A. Conform to the following Sections of Caltrans Standard Specifications:
 - 1. 51-7, Minor Structures.
 - 2. 70-5.02, Flared End Sections.
 - 3. 70-1.02H, Precast Concrete Structures.

2.11 PORTLAND CEMENT CONCRETE VEHICULAR PAVEMENT

- A. General: See Section 32 13 00 – Rigid Paving.

PART 3 - EXECUTION

3.01 STRUCTURAL EXCAVATION

- A. Structural excavation may be either by hand, or by machine and shall be neat to the line and dimension shown or called for on the plans. Excavation shall be sufficient width to provide adequate space for working therein, and comply with CAL-OSHA requirements.
- B. Where an excavation has been constructed below the design grade, refill the excavation to the bottom of the excavation grade with approved material and compact in place to 95% of the maximum dry density.
- C. Remove surplus excavation material remaining upon completion of the work from the job site, or condition it to optimum moisture content and compact it as fill or backfill on the site.

3.02 SOIL STERILANT

- A. Furnish and apply to areas indicated in accordance with Section 31 31 19 – Vegetation Control.

3.03 BRACING AND SHORING

- A. Conform to California and Federal OSHA requirements.
- B. Place and maintain such bracing and shoring as may be required to support the sides of the excavations for the proper protection of workmen; to facilitate the work; to prevent damage to the facility being constructed; and to prevent damage to adjacent structures or facilities. Remove all bracing and shoring upon completion of the work.
- C. Be solely responsible for all bracing and shoring and, if requested by the Owner's Representative, submit details and calculations to the Owner's Representative. The Owner's Representative may forward the submittal to the Consulting Engineer and/or the California Division of Industrial Safety for their review. The Contractor's submittal shall include the basic design, assumed soils conditions and estimation of forces to be resisted, together with plans and specifications of the materials and methods to be used, and shall be prepared by a civil engineer or structural engineer registered in California. No excavations related to the proposed facility shall precede a response to the submittal by the Owner's Representative.
- D. Be solely responsible for installing and extracting the sheathing in a manner which will not disturb the position or operation of the facility being constructed or adjacent utilities and facilities.

3.04 PLACING CONCRETE FORMS

- A. Form concrete improvements with a smooth and true upper edge. Side of the form with a smooth finish shall be placed next to concrete. Construct forms rigid enough to withstand the pressure of the fresh concrete to be placed without any distortion.
- B. Thoroughly clean all forms prior to placement and coat forms with an approved form oil in sufficient quantity to prevent adherence of concrete prior to placing concrete.
- C. Carefully set forms to the alignment and grade established and conform to the required dimensions. Rigidly hold forms in place by stakes set at satisfactory intervals. Provide sufficient clamps, spreaders and braces to insure the rigidity of the forms.

- D. Provide forms for back and face of curbs, lip of gutters and edge of walks, valley gutters or other surface slabs that are equal to the full depth of the concrete as shown, noted or called for on the Plans. On curves and curb returns provide composite forms made from benders or thin planks of sufficient ply to ensure rigidity of the form.

3.05 PLACING STEEL REINFORCEMENT

- A. Bars shall be free of mortar, oil, dirt, excessive mill scale and scabby rust and other coatings of any character that would destroy or reduce the bond. All bending shall be done cold, to the shapes shown on the plans. The length of lapped splices shall be as follows:
 - 1. Reinforcing bars No. 8, or smaller, shall be lapped at least 45 bar diameters of the smaller bar joined, and reinforced bars Nos. 9, 10, and 11 shall be lapped at least 60 bar diameters of the smaller bars joined, except when otherwise shown on the plans.
 - 2. Splice locations shall be made as indicated on the plans.
- B. Accurately place reinforcement as shown on the plans and hold firmly and securely in position by wiring at intersections and splices, and by providing precast mortar blocks or ferrous metal chairs, spacers, metal hangers, supporting wires, and other approved devices of sufficient strength to resist crushing under applied loads. Provide supports and ties of such strength and density to permit walking on reinforcing without undue displacement.
- C. Place reinforcing to provide the following minimum concrete cover:
 - 1. Surfaces exposed to water: 4-inches.
 - 2. Surfaces poured against earth: 3-inches.
 - 3. Formed surfaces exposed to earth or weather: 2-inches.
 - 4. Slabs, walls, not exposed to weather or earth: 1-inch.
- D. Minimum spacing, center of parallel bars shall be two and one half (2-1/2) times the diameter of the larger sized bar. Accurately tie reinforcing securely in place prior to pouring concrete. Placing of dowels or other reinforcing in the wet concrete is not permitted.

3.06 MIXING AND TRANSPORTING PORTLAND CEMENT CONCRETE

- A. Transit mix concrete in accordance with the requirements of ASTM Designation C 94. Transit mix for not less than ten (10) minutes total, not less than three (3) minutes of which shall be on the site just prior to pouring. Mix continuous with no interruptions from the time the truck is filled until the time it is emptied. Place concrete within one hour of the time water is first added unless authorized otherwise by the Owner's Representative.
- B. Do not hand mix concrete for use in concrete structures.

3.07 PLACING PORTLAND CEMENT CONCRETE

- A. Thoroughly wet subgrade when concrete is placed directly on soil. Remove all standing water prior to placing concrete.
- B. Do not place concrete until the subgrade and the forms have been approved.
- C. Convey concrete from mixer to final location as rapidly as possible by methods that prevent separation of the ingredients. Deposit concrete as nearly as possible in final position to avoid re-handling.
- D. Place and solidify concrete in forms without segregation by means of mechanical vibration or by other means as approved by the Owner's Representative. Continue vibration until the material is sufficiently consolidated and absent of all voids without causing segregation of material. The use of vibrators for extensive shifting of fresh concrete will not be permitted.
- E. Concrete in certain locations may be pumped into place upon prior approval by the Owner's Representative. When this procedure requires redesign of the mix, such redesign shall be submitted for approval in the same manner as herein specified for approval of design mixes.

3.08 PLACING ACCESSORY MATERIALS

- A. Place water stops and other items required to be embedded in of portland cement concrete structures at locations shown or required in accordance with Section 51 of the Caltrans Standard Specifications unless otherwise specifically noted or called for on the Plans.
- B. Curing Compounds:
 - 1. Regular Portland Cement Concrete: Apply "Non-Pigmented Curing Compound - chlorinated Rubber Base-Clear" in accordance with Section 90-1.03B(3), 1.03B(5) and 1.03B of the Caltrans Standard Specifications.
 - 2. Color Conditioned Decorative Portland Cement Concrete: Apply LITHOCHROME colorwax in accordance with the manufactures instructions.

3.09 EXPANSION JOINTS

- A. Construct expansion joints incorporating premolded joint fillers at twenty (20) foot intervals in all concrete curbs, gutters, sidewalks, median/island paving, valley gutters, driveway approaches and at the ends of all returns. At each expansion joint install one-half inch by twelve inch (1/2" x 12") smooth slip dowels in the positions shown or noted on the detail drawings.
- B. Orient slip dowels at right angles to the expansion joint and hold firmly in place during the construction process by means of appropriate chairs.

3.10 WEAKENED PLANE JOINTS

- A. Construct weakened plane joints in concrete curbs, gutters, sidewalks, median/island paving and valley gutters between expansion joints at ten (10) foot intervals throughout, or as otherwise indicated. Depth of joint score depth to be one-fourth (25%) the thickness of the concrete.
 - 1. Grooved Joints: Form weakened plane joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8-inch. Repeat grooving of weakened plane joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.

3.11 FINISHING CONCRETE

- A. Finish curb and gutter in conformance with the applicable requirements of Section 73-1.03C and 73-1.05A of the Caltrans Standard Specifications as modified herein.
- B. Where monolithic curb, gutter and sidewalk is specified, separate concrete pours will not be allowed.
- C. Provide a medium broom finish to all horizontal surfaces unless otherwise shown.

3.12 FORM REMOVAL

- A. Remove forms without damage to the concrete. Remove all shores and braces below the ground surface, before backfilling.
- B. Do not backfill against concrete until the concrete has developed sufficient strength to prevent damage.
- C. Leave forms for cast-in-place walls in place at least 72 hours after pouring.
- D. Leave edge forms in place at least 24 hours after pouring.

3.13 CONSTRUCTION

- A. Form, place and finish concrete walkways, island paving, valley gutters and driveway approaches in conformance with the applicable requirements of Section 73-1.03C and 73-3 of the Caltrans Standard Specifications as modified herein.
- B. Construct new concrete curb, curb and gutter and valley gutters against existing asphalt concrete by removing a minimum of 12-inches of the asphalt concrete to allow placement of curb or gutter forms. Patch pavement with a 6-inch deep lift of asphalt concrete after gutter form is removed.

3.14 CONNECTING TO EXISTING CONCRETE IMPROVMENTS

- A. New curb, gutter, or sidewalk is to connect to existing improvements to remain by saw cutting to existing sound concrete at the nearest score line, expansion joint or control joint. Drill and insert ½-inch diameter by 12-inch long dowels at 24-inches on center into existing improvements. Install pre-molded expansion joint filler at the matching joint.
- B. A cold joint to the existing curb is not acceptable.

3.15 DECORATIVE SURFACING CONSTRUCTION

- A. Decorative surfacing concrete walks, concrete median islands or other installations shall be formed and placed as a concrete slab conforming to the details shown or noted on the Plans.

3.16 FIELD QUALITY CONTROL

- A. Finish subgrade for concrete improvements shall be subject to approval prior to placement of forms.
- B. No concrete shall be placed prior to approval of forms.
- C. Concrete improvements constructed shall not contain "bird baths" or pond water and shall be smooth and ridge free.
- D. Conform the finish grade at top of curb, flow line of gutter, and the finish cross section of concrete improvements to the design grades and cross sections.
- E. Variation of concrete improvements from design grade and cross section as shown or called for on the plans shall not exceed the tolerances established in Sections 73-1.03 and/or 73-3 of the Caltrans Standard Specifications.

3.17 RESTORATION OF EXISTING IMPROVEMENTS

- A. Replace in kind all pavement or other improvements removed or damaged due to the installation of concrete improvements.
- B. Remove, landscaping or plantings damaged or disturbed due to the installation of concrete improvements. Replace in kind.

END OF SECTION

SECTION 32 11 00

BASE COURSES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Aggregate subbase.
- B. Aggregate base.
- C. Cement treated base.
- D. Lime stabilization.

1.02 RELATED DOCUMENTS

- A. ASTM:
 - 1. D 3740, Standard Practice for Minimum Requirement for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
 - 2. E 329, Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
 - 3. E 548, Standard Guide for General Criteria Used for Evaluating Laboratory Competence.
- B. Caltrans Standard Specifications:
 - 1. Section 24-2, Lime Stabilized Soil.
 - 2. Section 25, Aggregate Subbases.
 - 3. Section 26, Aggregate Bases.
 - 4. Section 27, Cement Treated Bases.

1.03 DEFINITIONS

- A. Geotechnical Testing Agency: An independent testing agency qualified according to ASTM E 329 to conduct soil materials and rock definition testing, as documented according to ASTM D 3740 and ASTM E 548.
- B. Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material $\frac{3}{4}$ -cubic yards or more in volume that when tested, according to ASTM D 1586, exceeds a standard penetration resistance of 100 blows/2-inches.
- C. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man made stationary features constructed above or below grade.
- D. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, base or topsoil materials.

1.04 SUBMITTALS

- A. Follow submittal procedures outlined in Section 01 33 00 – Submittal Procedures.
- B. Submit material certificates signed by the material producer and the Contractor, certifying that that each material item complies with, or exceeds the specified requirements.

1.05 QUALITY ASSURANCE

- A. Percentage of compaction specified shall be the minimum acceptable. The percentage represents the ratio of the dry density of the compacted material to the maximum dry density of the material as determined by the procedure set forth in ASTM D 1557.

- B. Do not mix or place cement treated base when the temperature is below 36 degrees F or when the ground is frozen.
- C. Finish surface of material to be stabilized prior to lime treatment shall be as specified in Section 24-2.01D(1)(a) of Caltrans Standard Specifications.
- D. Finish surface of the stabilized material after lime treatment shall be as specified in Section 24-2.03F of Caltrans Standard Specifications.
- E. Finish surface of cement treated base shall be as specified in Section 27 of Caltrans Standard Specifications.
- F. Do not project the finish surface of aggregate subbase above the design subgrade.
- G. Finish grade tolerance at completion of base installation: +0.05'

1.06 PROJECT CONDITIONS

- A. Protect open excavations, trenches, and the like with fences, covers and railings to maintain safe pedestrian and vehicular traffic passage.
- B. Temporarily stockpile material in an orderly and safe manner and in a location approved by the Owner.
- C. Provide dust and noise control in conformance with Division 1 General Requirements.

PART 2 - PRODUCTS

2.01 AGGREGATE SUBBASE

- A. Material: Caltrans Standard Specification Section 25.
 - 1. Class 1, 2, or 3: Section 25-1.02B.
 - 2. Class 4: Section 25-1.02C.
 - 3. Class 5: Section 25-1.02D.

2.02 AGGREGATE BASE

- A. Material: Caltrans Standard Specification Section 26.
 - 1. Class 2, 1-1/2-inch Maximum: Section 26-1.02B.
 - 2. Class 2, 3/4-inch Maximum: Section 26-1.02B.
 - 3. Class 3: Section 26-1.02C.

2.03 CEMENT TREATED BASE

- A. Materials: Caltrans Standard Specification Section 27-1.02.

2.04 LIME STABILIZATION

- A. Lime Treatment Material: Conform to Section 24-2.03B and 24-2.03C of Caltrans Standard Specifications.

PART 3 - EXECUTION

3.01 GENERAL

- A. Placement and compaction of material by flooding, ponding, or jetting will not be permitted.

3.02 WET WEATHER CONDITIONS

- A. Do not place or compact subgrade if above optimum moisture content.

3.03 AGGREGATE SUBBASE

- A. Spreading and Compacting: Sections 25-1.03D and 25-1.03E of Caltrans Standard Specifications.

3.04 AGGREGATE BASE

- A. Spreading and Compacting: Section 26-1.03D and 26-1.03E of Caltrans Standard Specifications.

3.05 CEMENT TREATED BASE

- A. Cement treated base shall be as follows: Proportioning and Mixing Plant-Mixed: Section 27-1.03D of Caltrans Standard Specifications.

3.06 LIME STABILIZATION

- A. Performing the stabilization shall conform to Section 24-2.03C through 24-2.03F of Caltrans Standard Specifications and the following:
1. Add lime in the amount specified by a Geotechnical Consultant.
 2. Lime treat subgrade soils from back of curb to back of curb to a depth specified by a Geotechnical Consultant.
 3. Mix in two mixing periods, both with the tines lowered to the same depth. Both mixing periods shall be monitored and verified by a Geotechnical Consultant. The second mixing shall occur at about 36 hours after the initial mixing.
 4. Compact and grade the lime mixed subgrade immediately after the second mixing.
 5. Compact the lime treated subgrade to 95 percent as determined by ASTM D1557.
 6. After application of the curing seal, do not allow traffic on the lime treated material for a period of 7 days in lieu of the 3 days specified in Section 24-2.03A of Caltrans Standard Specifications.
 7. Proof-roll the stabilized subgrade after compacting to confirm that a non-yielding surface has been achieved. Yielding areas, if any, shall be mitigated. Mitigation could consist of over-excavation, utilization of stabilization fabric, or chemical treatment. Each case shall be addressed individually in the field by a Geotechnical Consultant.

3.07 DISPOSAL

- A. Lawfully dispose of all unsuitable and excess or surplus material off-site at no cost to the Owner.

END OF SECTION

SECTION 32 13 00

RIGID PAVING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Furnishing, placing, spreading, compacting and shaping portland cement concrete pavement with undoweled transverse weakened plane joints, for vehicular traffic.
- B. Form construction and use in placing portland cement concrete pavement.
- C. Joints for portland cement concrete pavement.
- D. Finishing portland cement concrete pavement.
- E. Curing and protecting portland cement concrete pavement.

1.02 RELATED DOCUMENTS

- A. AASHTO Standard Specifications
 - 1. T 53: Standard Method of Test for Softening Point of Bitumen (Ring-and-Ball Apparatus).
- B. ASTM Standards
 - 1. A 615: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 - 2. A 775: Standard Specification for Epoxy-Coated Steel Reinforcing Bars.
 - 3. A 934: Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars.
 - 4. C 881: Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
 - 5. D 2628: Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements.
 - 6. D 2835: Standard Specification for Lubricant for Installation of Preformed Compression Seals in Concrete Pavements.
 - 7. D 6690: Standard Specification for Joint and Crack Sealants, Hot-Applied , for Concrete and Asphalt Pavements.
 - 8. D 3963: Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars.
- C. Caltrans Standard Specifications:
 - 1. Section 40, Concrete Pavement.
 - 2. Section 52, Reinforcement.
 - 3. Section 90, Concrete.
 - 4. Section 95, Epoxy.
- D. Caltrans Standard Plans:
 - 1. Plan A35A: Portland Cement Concrete Pavement (Undoweled Transverse Joints).
 - 2. Plan A35C: Portland Cement Concrete Pavement Joint and End Anchor Details.

1.03 DEFINITIONS

- A. AASHTO: American Association of State Highway and Transportation Officials.
- B. ASTM: American Society for Testing and Materials.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
 - 1. Manufacturer must be certified according to the National Ready Mix Concrete Plant Certification Program.
- B. Installer Qualification: An experienced installer who has completed pavement work similar in material, design and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- C. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant and each aggregate from one source.

1.05 SUBMITTALS

- A. Follow submittal procedures outlined in Section 01 33 00 – Submittal Procedures.
- B. Design Mixes: For each concrete pavement mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results or other circumstances warrant adjustments.
- C. Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements.
 - 1. Cementitious materials and aggregates.
 - 2. Steel reinforcement and reinforcement accessories.
 - 3. Admixtures.
 - 4. Curing compound.
 - 5. Applied finish material.
 - 6. Bonding agent of adhesive.
 - 7. Joint filler.
 - 8. Joint Sealant.
 - 9. Tie Bars.
 - 10. Epoxy.
 - 11. Backer Rods.

PART 2 - PRODUCTS

2.01 PORTLAND CEMENT CONCRETE

- A. General: Conform to Caltrans Standard Specifications, Section 90. Use Class 2 Concrete.

2.02 TIE BARS

- A. Deformed reinforcing steel bars conforming to the requirements of ASTM Designation A 615/A (615M), Grade 40 or 60 (Grade 300 or 420).

- B. Epoxy-coat in conformance with the provisions in Section 52-2.02 of Caltrans Standard Specifications, except that references made to ASTM Designation D 3963/D 3963M shall be deemed to mean ASTM Designation A 934/A 934M or A 775/775M.
- C. Do not bend tie bars.

2.03 EPOXY

- A. Bond tie bars to existing concrete with epoxy resin conforming to Section 95-1.02D, "Epoxy Resin Adhesive for Bonding Freshly Mixed Concrete to Hardened Concrete," of the Caltrans Standard Specifications.

2.04 SILICONE JOINT SEALANT

- A. Furnish low modulus silicone joint sealant in a one-part silicone formulation. Do not use acid cure sealants. Compound to be compatible with the surface to which it is applied and conform to the following requirements:

Specification	Test Method	Requirement
Tensile stress, 150% elongation, 7-day cure at 25° ± 1°C and 45% to 55% R.H. ^e	ASTM D 412 (Die C)	310 kPa max.
Flow at 25° ± 1°C	ASTM C 639 ^a	Shall not flow from channel
Extrusion Rate at 25° ± 1°C	ASTM C 603 ^b	75-250 g/min.
Specific Gravity	ASTM D 792 Method A	1.01 to 1.51
Durometer Hardness, at -18°C, Shore A, cured 7 days at 25° ± 1°C	ASTM C 661	10 to 25
Ozone and Ultraviolet Resistance, after 5000 hours	ASTM C 793	No chalking, cracking or bond loss
Tack free at 25° ± 1°C and 45% to 55% R.H. ^e	ASTM C 679	Less than 75 minutes
Elongation, 7 day cure at 25° ± 1°C and 45% to 55% R.H. ^e	ASTM D 412 (Die C)	500 percent min.
Set to Touch, at 25° ± 1°C and 45% to 55% R.H. ^e	ASTM D 1640	Less than 75 minutes
Shelf Life, from date of shipment	—	6 months min.
Bond, to concrete mortar-concrete briquets, air cured 7 days at 25° ± 1°C	AASHTO T 132 ^c	345 kPa min.
Movement Capability and Adhesion, 100% extension at -18°C after, air cured 7 days at 25° ± 1°C, and followed by 7 days in water at 25° ± 1°C	ASTM C 719 ^d	No adhesive or cohesive failure after 5 cycles

Notes:

ASTM Designation: C 639 Modified (15 percent slope channel A).

ASTM Designation: C 603, through 3-mm opening at 345 kPa.

Mold briquets in conformance with the requirements in AASHTO Designation: T 132, sawed in half and bonded with a 1.5 mm maximum thickness of sealant and tested in conformance with the requirements in AASHTO Designation: T 132. Briquets shall be dried to constant mass at $100 \pm 5^\circ \text{C}$.

Movement Capability and Adhesion: Prepare 305 mm x 25 mm x 75 mm concrete blocks in conformance with the requirements in ASTM Designation: C 719. A sawed face shall be used for bond surface. Seal 50 mm of block leaving 12.5 mm on each end of specimen unsealed. The depth of sealant shall be 9.5 mm and the width 12.5 mm.

- a. R.H. equals relative humidity.
- B. Formulate the silicon joint sealant to cure rapidly enough to prevent flow after application on grades of up to 15 percent.
- C. Furnish to the Owner a Certificate of Compliance. Accompany certificate with a certified test report of the results of the required tests performed on the sealant material within the previous 12 months prior to proposed use. Provide the certificate and accompanying test report for each lot of silicone joint sealant prior to use on the project.

2.05 ASPHALT RUBBER JOINT SEALANT

- A. Conform to the requirements of ASTM Designation: D 6690 as modified herein or to the following:
 1. Provide a mixture of paving asphalt and ground rubber. Ground rubber to be vulcanized or a combination of vulcanized and de-vulcanized materials ground so that 100 percent will pass a 2.36-mm sieve and contain not less than 22 percent ground rubber, by mass. Modifiers may be used to facilitate blending.
 2. The Ring and Ball softening point shall be 57°C minimum, when tested in conformance with the requirements in AASHTO Designation: T 53.
 3. Provide asphalt rubber sealant material capable of being melted and applied to cracks and joints at temperatures below 204°C .
- B. The penetration requirement of Section 4.2 of ASTM Designation: D 6690 do not apply. The required penetration at 25°C , 150g, 5s, shall not exceed 120.
- C. The resilience requirement of Section 4.5 of ASTM Designation: D 6690 do not apply. The required resilience, when tested at 25°C , shall have a minimum of 50 percent recovery.
- D. Accompany each lot of asphalt rubber joint sealant shipped to the job site, whether as specified herein or conforming to the requirements of ASTM Designation D 6690, as modified herein, by a Certificate of Compliance, storage and heating instructions and precautionary instructions for use.
- E. Heat and place in conformance with the manufacturer's written instructions and the details shown on the plans. Provide manufacturer's instructions to the Owner. Do not place when the pavement surface temperature is below 10°C .

2.06 PREFORMED COMPRESSION JOINT SEALANT

- A. Material: ASTM Designation: D 2628.
 1. Number of cells: 5 or 6.
 2. Lubricant Adhesive: ASTM Designation D 2835.
 3. Install compression seals along with lubricant adhesive according to the manufacturer's recommendations. Submit manufacturer's recommendations to the Owner's Representative`.

- B. Accompany each lot of compression seal and lubricant adhesive by a Certificate of Compliance, storage instructions and precautionary instructions for use. Also submit the manufacturer's data sheet with installation instructions and recommended model or type of preformed compression seal for the joint size and depth as shown on the plans. Show evidence that the selected seal is being compressed at level between 20 and 50 percent at all times for the joint width and depth shown on the plans.

2.07 BACKER RODS

- A. Provide backer rods that have a diameter prior to placement at least 25 percent greater than the width of the saw cut after sawing and are expanded, crosslinked, closed-cell polyethylene foam that is compatible with the joint sealant so that no bond, adverse reaction occurs between the rod and sealant. In no case use a hot pour sealant that will melt the backer rod. Submit a manufacturer's data sheet verifying that the backer rod is compatible with the sealant to be used.

PART 3 - EXECUTION

3.01 WATER SUPPLY

- A. Conform to Section 40-1.02 of Caltrans Standard Specifications.

3.02 SUBGRADE

- A. Conform to Section 40-1.04 of Caltrans Standard Specifications.

3.03 SOIL STERILANT

- A. Furnish and apply to areas indicated in accordance with Section 31 31 19 – Vegetation Control.

3.04 PLACING

- A. Conform to Section 40-1.03F of Caltrans Standard Specifications.

3.05 SPREADING COMPACTING AND SHAPING

- A. Conform to Section 40-1.07 of Caltrans Standard Specifications.
 - 1. Stationary Side Form Construction: Section 40-1.03F(4) of Caltrans Standard Specifications.
 - 2. Slip Form Construction: Section 40-1.03F(5) of Caltrans Standard Specifications.

3.06 INSTALLING TIE BARS

- A. Install at longitudinal contact joints, longitudinal weakened plane joints, and transverse contact joints as shown on the plans. In no case, shall any consecutive width of new portland cement concrete pavement tied together with tie bars exceed 15 meters. In no case shall tie bars be used at a joint where portland cement concrete and asphalt concrete pavements abut.
- B. Tie bars shall be installed at longitudinal joints by one of the 3 following methods:
 - 1. Drilling and bonding in conformance with the details shown on the plans. Provide a two-component, epoxy-resin, conforming to the requirements of ASTM Designation: C 881, Type V. Grade 3 (Non-Sagging), Class shall be as follows:

<u>Temperature of Concrete</u>	<u>Required Class of Epoxy Resin</u>
Lower than 40° F (4.5 °C)	A
40° F (4.5° C) through 60° F (15.5° C)	B
Above 60° F (15.5° C)	C

2. Provide, at least 7 days prior to start of work, a Certificate of compliance and a copy of the manufacturer's recommended installation procedure. The drilled holes shall be cleaned in accordance with the epoxy manufacturer's instructions and shall be dry at the time of placing the epoxy and tie bars. Immediately after inserting the tie bars into the epoxy, the tie bars shall be supported as necessary to prevent movement during the curing and shall remain undisturbed until the epoxy has cured a minimum time as specified by the manufacturer. Tie bars that are improperly bonded, as determined by the Owner, will be rejected. If rejected, adjacent new holes shall be drilled, as directed by the Owner, and new tie bars shall be placed and securely bonded to the concrete. All work necessary to correct improperly bonded tie bars shall be performed at the Contractor's expense.
3. Insert the tie bars into the plastic slip-formed concrete before finishing the concrete. Inserted tie bars shall have full contact between the bar and the concrete. When tie bars are inserted through the pavement surface, the concrete over the tie bars shall be reworked and refinished to such an extent that there is no evidence on the surface of the completed pavement that there has been any insertion performed. Any loose tie bars shall be replaced by drilling and grouting into place with epoxy as described in method 1 above at the Contractor's expense.
4. By using threaded dowel splice couplers fabricated from deformed bar reinforcement material, free of external welding or machining. Threaded dowel splice couplers shall be accompanied by a Certificate of Compliance and installation instructions. Installation of threaded dowel splice couplers shall conform to the requirements of the manufacturer's recommendations.

3.07 JOINTS

- A. Conform to Section 40-1.03B of Caltrans Standard Specifications, except that tie bars shall be as specified under Part 2, Products.
 1. Transverse Contact Joints: Section 40-1.08A of Caltrans Standard Specifications.
 - (a) Construct a transverse contact (construction) joint at the end of each day's work, or where concrete placement is interrupted for more than 30 minutes, to coincide with the next weakened plane joint location.
 - (b) If sufficient concrete has not been mixed to form a slab to match the next weakened plane joint, when an interruption occurs, the excess concrete shall be removed and disposed of back to the last preceding joint. The cost of removing and disposing of any excess concrete shall be at the Contractor's expense. Any excess material shall become the property of the Contractor and shall be properly disposed of.
 - (c) A metal or wooden bulkhead (header) shall be used to form the joint. The bulkhead shall be designed to accommodate the installation of tie bars.
 2. Weakened Plane Joints: Section 40-1.08B, except that the insert method of forming joints in pavement shall not be used.

3.08 FINISHING

- A. Conform to Sections 40-1.03H(2) and 40-1.103H(3) of Caltrans Standard Specifications.

3.09 CURING

- A. Conform to Section 40-1.03I of Caltrans Standard Specifications.

3.10 SEALING JOINTS

- A. Liquid Joint Sealant Installation.
 1. The joint sealant detail for transverse and longitudinal joints, as shown on the plans, shall apply only to weakened plane joints. Construct weakened plane joints by the sawing method. Should grinding or grooving be required over or adjacent to any joint after sealant has been placed, completely remove the joint material and disposed of, and replace at the Contractor's expense. Recess sealant below the final finished surface as shown on the plans.

2. At the Contractor's option, transverse weakened plane joints shall be either Type DSC or Type SSC as shown on the plans. Longitudinal weakened plane joints shall be Type SSC only as shown on the plans.
3. Seven days after the concrete pavement placement and not more than 4 hours before placing backer rods and joint sealant materials, clean the joint walls by the dry sand blast method and other means as necessary to completely remove from the joint all objectionable material such as soil, asphalt, curing compound, paint and rust. After cleaning the joint, remove all traces of sand, dust and loose material from and near the joint for a distance along the pavement surfaces of at least 50 mm on each side of the joint by the use of a vacuum device. Remove surface moisture at the joints by means of compressed air or moderate hot compressed air or other means approved means. Do not use drying procedures that leave a residue or film on the joint wall. Sandblasting equipment shall have a maximum nozzle diameter size of 6 ± 1 mm and a minimum pressure of 0.62-MPa.
4. Install backer rod as shown on the plans. Provide an expanded, closed-cell polyethylene foam backer rod that is compatible with the joint sealant so that no bond or adverse reaction occurs between the rod and sealant. Install backer rod when the temperature of the portland cement concrete pavement is above the dew point of the air and when the air temperature is 4°C or above. Install backer rod when the joints to be sealed have been properly patched, cleaned and dried. Do not use a method of placing backer rod that leave a residue or film on the joint walls.
5. Immediately after placement of the backer rod, place the joint sealant in the clean, dry, prepared joints as shown on the plans. Apply the joint sealant by a mechanical device with a nozzle shaped to fit inside the joint to introduce the sealant from inside the joint. Apply adequate pressure to the sealant to ensure that the sealant material is extruded evenly and that full continuous contact is made with the joint walls. After application of the sealant recess the surface of the sealant as shown on the plans.
6. Any failure of the joint material in either adhesion or cohesion of the material will be cause for rejection of the joint. Conform the finished surface of joint sealant to the dimensions and allowable tolerances shown on the plans. Rejected joint materials or joint material whose finished surface does not conform to the dimensions shown on the plans shall be repaired or replaced, at the Contractor's expense, with joint material that conforms to the requirements.
7. After each joint is sealed, remove all surplus joint sealer on the pavement surface. Traffic shall not be permitted over the sealed joints until the sealant is tack free and set sufficiently to prevent embedment of roadway debris into the sealant.

B. Preformed Compression Joint Seal Installation

1. The compression seal alternative joint detail for transverse and longitudinal joints, as shown on the plans, shall apply only to weakened plane joints. Construct weakened plane joints by the sawing method. Should grinding or grooving be required over or adjacent to any joint after the compression seal has been placed, completely remove the joint materials and disposed of, and replace at the Contractor's expense. Compression seal shall be recessed below the final finished surface as shown on the plans.
2. At the Contractor's option, transverse weakened plane joints shall be either Type DSC or Type SSC as shown on the plans. Longitudinal weakened plane joints shall be Type SSC only as shown on the plans.
3. Seven days after the concrete pavement placement and not more than 4 hours before placing preformed compression joint seals, clean the joint walls by the dry sand blast method and other means as necessary to completely remove from the joint all objectionable material such as soil, asphalt, curing compound, paint and rust. After cleaning the joint, remove all traces of sand, dust and loose material from and near the joint for a distance along the pavement surfaces of at least 50 mm on each side of the joint by the use of a vacuum device. Remove surface moisture at the joints by means of compressed air or moderate hot compressed air or other means. Do not use drying procedures that leave a residue or film on the joint wall. Sandblasting equipment shall have a maximum nozzle diameter size of 6 ± 1 mm and a minimum pressure of 0.62-MPa.

3.11 PROTECTING CONCRETE PAVEMENT

- A. Conform to Section 40-1.12 of Caltrans Standard Specifications.

END OF SECTION

SECTION 32 31 13

CHAIN LINK FENCES AND GATES

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fence framework, fabric, and accessories.
- B. Excavation for post bases.
- C. Concrete anchorage for posts and center drop for gates.
- D. Manual gates and related hardware.

1.2 REFERENCES

- A. ASTM A90 - Standards Test Method for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles.
- B. ASTM A392 - Zinc-Coated Steel Chain Link Fence Fabric.
- C. ASTM A428 - Weight of Coating on Aluminum-coated Iron or Steel Articles.
- D. ASTM A491 - Aluminum-Coated Steel Chain Link Fence Fabric.
- E. ASTM F567 - Installation of Chain-Link Fence.
- F. ASTM A653 – Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
- G. ASTM F668 - Poly (Vinyl Chloride) (PVC) Coated Steel Chain Link Fence Fabric.
- H. ASTM F900 - Industrial and Commercial Swing Gates.
- I. ASTM A924 – General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
- J. ASTM F 1043 - Standard Specification for Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework.
- K. ASTM F1083 - Pipe, Steel, Hot-dipped Zinc-coated (Galvanized) Welded for Fence Structures.
- L. ASTM F1184 - Industrial and Commercial Horizontal Slide Gates.
- M. ASTM F1043 - Strength and Protective Coatings on Metal Industrial Chainlink Fence Framework.
- N. CBC - California Building Code, (CCR) California Code of Regulations, Title 24, Part 2, California State Accessibility and Egress Standards.

1.3 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in commercial quality chain link fencing with five years documented experience.
- B. Installation: ASTM F567.

1.4 REGULATORY REQUIREMENTS

- A. Conform to disabled person access and emergency egress requirements of the CBC California Building Code, (CCR) California Code of Regulations, Title 24, Part 2.

1.5 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 01 33 00.
- B. Include plan layout, grid, spacing of components, accessories, fittings, hardware, anchorages, and schedule of components.
- C. Submit manufacturer's installation instructions under provisions of Section 01 33 00.
- D. Submit samples under provisions of Section 01 33 00.
- E. Submit two samples 12 x 12 inches in size, illustrating fence fabric finish.
- F. Submit project record documents under provisions of Section 01 77 00.
- G. Accurately record actual locations of property perimeter posts relative to property lines and easements.

2. PART 2 PRODUCTS

2.1 MATERIALS

- A. Framework: ASTM F1083; Schedule 40 steel pipe, standard weight, one piece without joints, finish same as fabric.
- B. Acceptable Equivalent: ASTM F1043; Group 1A pipe with minimum yield strength of 30,000 pounds per square inch; SS40 as manufactured by Allied Tube and Conduit Fence Division, www.atcfence.com.
- C. Fabric: ASTM F668, Class 2b, PVC coated.

2.2 CONCRETE MIX

- A. Concrete: As specified in Section 03 30 00.

2.3 COMPONENTS

- A. Line Posts: 2 inch NPS steel pipe.
- B. Corner and Terminal Posts: 3 inch NPS steel pipe.
- C. Gate Posts: 3 inch NPS steel pipe.
- D. Top and Brace Rail: 1-1/4 inch NPS, plain end, sleeve coupled steel pipe.
- E. Fabric: 2 inch diamond mesh steel wire, interwoven, 9 gage thick, top and bottom selvage knuckle end closed.
- F. Caps: Cast steel or malleable iron, galvanized; sized to post dimension, set screw retained.
- G. Fittings: Sleeves, bands, clips, rail ends, tension bars, fasteners and fittings: Steel.
- H. Tension Wire: 7 gage thick steel, single strand.
- I. Swinging Gates: Constructed of tubular members welded at all corners in conformance with ASTM F900 and the following:
 - 1. Gate Posts: 3 inch NPS steel pipe for gates up to 6 foot for a single gate or a single leaf of a double gate. 4 inch NPS steel pipe for gates over 6 foot in width.
 - 2. Gate Frames: 1-1/4 inch NPS steel pipe, for welded fabrication with vertical intermediate brace at maximum 6 foot spacing and horizontal brace on all gates.
 - 3. Gate Fabric: To match adjacent fencing.

4. Gate Hardware: Fork type latch with gravity drop and provision for padlock; center gate stop; three 180 degree gate hinges per leaf. Mammoth 180 Hinge / Closure with CLB brackets as manufactured by Locinox, www.locinox.com.
5. Accessible Gate Hardware:
 - (a) Mortise lock keyed 2 sides: Schlage Commercial Latch L9010, www.schlage.com or Sargent Lock No. 8126, www.sargentlock.com.
 - (b) Cylinder lock keyed 2 sides: Schlage Commercial Latch No. L9066, www.schlage.com.
 - (c) Panic bar exit device: Von Duprin AX-PA-99L x 996-03 626, www.vonduprin.com. Rim cylinder 20-057-ICX 626 with permanent core 23-030-626, www.schlage.com.
 - (d) Kickplate: Commercial quality cold rolled steel conforming to ASTM A653 galvanized to G60 coating class according to ASTM A924 with minimized spangle, mill phosphatized, 0.067 inch thick, with all exposed edges hemmed. Finish to match fencing.
 - (e) Security Screen: Perforated commercial quality cold rolled steel conforming to ASTM A653 galvanized to G60 coating according to ASTM A924 with minimized spangle, mill phosphate, 0.067 inch thick, 1 / 4 inch diameter holes on 3 / 8 inch staggered centers, 40 percent open. All exposed edges hemmed. Finish to match fencing.
 - (f) Substitutions: Under provisions of Section 01 25 13.

2.4 FINISHES

- A. Galvanized: ASTM F1043; 1.8 oz/sq ft coating for schedule 40 pipe. ASTM A90; 1.0 oz/sq ft coating for Class 1A pipe.
- B. Aluminum Coating: ASTM A428; 0.40 oz/sq ft.
- C. Vinyl Coating: ASTM F668, Class 2b PVC coating Black color on galvanized coating.
- D. Accessories: Same finish as framing.

3. PART 3 EXECUTION

3.1 INSTALLATION

- A. Install framework, fabric, accessories and gates in accordance with ASTM F567.
- B. Provide fence of height indicated.
- C. Space line posts at intervals not exceeding 10 feet.
- D. Set terminal, gate and corner posts plumb, in 12 inch diameter concrete footings with top of footing 6 inches below finish grade. Slope top of concrete for water runoff. Footing depth below finish grade: 42 inches for gate and corner posts, 36 inches for line posts.
- E. Provide top rail through line post tops and splice with 7 inch long rail sleeves.
- F. Brace each gate and corner post back to adjacent line post with horizontal center brace rail and diagonal truss rods. Install brace rail, one bay from end and gate posts.
- G. Install center and bottom brace rail on corner and gate leaves.
- H. Stretch fabric between terminal posts or at intervals of 100 feet maximum whichever is less.
- I. Do not stretch fabric until concrete has cured 28 days.
- J. Position bottom of fabric 2 inches above finished grade.

- K. Fasten fabric to top rail, line posts, braces, and bottom tension wire with wire ties maximum 15 inches on centers.
- L. Attach fabric to end, corner, and gate posts with tension bars and tension bar clips.
- M. Install bottom tension wire stretched taut between terminal posts.
- N. Install gates with fabric to match fence. Install three hinges per leaf, latch, catches.
- O. Provide concrete center drop to foundation depth and drop rod retainers at center of double gate openings.
- P. Ground fencing that encloses electrical power distribution equipment as required by National Electric Safety Code, Article IEEE C2.
- Q. Install accessible gate hardware at 3'-4" to centerline of hand activated operable gate opening hardware.
- R. Install 10 inch high smooth metal kickplate on each side of accessible gate. Mount 2 inches above finished grade.
- S. Install security screening on accessible gate and on each side of accessible gate a minimum of 4 feet from both hinge and strike sides of gate. Attach screen to fence and gate posts with flat head self-tapping sheet metal screws at maximum 12 inches on center to match hole spacing.

3.2 ERECTION TOLERANCES

- A. Maximum Variation from Plumb: 1/4 inch.
- B. Maximum Offset from True Position: 1 inch.
- C. Components shall not infringe adjacent property lines.

END OF SECTION

SECTION 33 05 16

UTILITY STRUCTURES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Manhole structures for gravity storm drain and sanitary sewer utilities.

1.02 RELATED DOCUMENTS

A. AASHTO:

- 1. M 199: Standard Specification for Precast Reinforced Concrete Manhole Sections.

B. ASTM:

- 1. A 615/A615M: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
- 2. C 478: Standard Specification for Circular Precast Reinforced Concrete Manhole Sections.
- 3. C 1244: Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill.

C. Caltrans Standard Specifications.

- 1. Section 51, Concrete Structures.
- 2. Section 75, Miscellaneous Metal.

D. California Building Code.

- 1. Section 1127B – Exterior Routes of Travel.

1.03 DEFINITIONS

- A. AASHTO: American Association of State Highway and Transportation Officials.

- B. ASTM: American Society for Testing Materials.

1.04 SUBMITTALS

- A. Follow submittal procedures outlined in Section 01 33 00 – Submittal Procedures.

- B. Product data for the following:

- 1. Cleanout plugs or caps.

- C. Shop drawings: Include plans, elevations, details and attachments for the following:

- 1. Precast concrete manholes, frames and covers.
- 2. Precast concrete clean out boxes and box covers.

- D. Design Mix Reports and Calculations: For each class of cast-in-place concrete.

- E. Field Test Reports: Indicate and interpret test results for compliance with performance.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Handle precast concrete manholes according to manufacturer's written instructions.

- B. Protect imported bedding and backfill material from contamination by other materials.

PART 2 - PRODUCTS

2.01 CLEANOUTS

- A. Piping: Same as sanitary sewer line if possible.
- B. Top Cap: Threaded and of same material as piping if possible.
- C. Box Size: As required to provide access and allow easy removal and reinstallation of cap.
- D. Box Types:
 - 1. Landscape Areas: Portland cement concrete box and box cover (bolt-down), light duty.
 - 2. Traffic Areas: Portland cement concrete box and box cover or steel or cast iron cover, heavy duty, both box and cover (bolt down) to be rated for AASHTO H20 loading.
- E. Box Cover Markings: "S.D." for storm drain cleanouts, "S.S." for sanitary sewer cleanouts, unless otherwise specified.
- F. Available Manufacturers: Subject to compliance with requirements, box manufacturers offering products that may be incorporated into the Project include, but are not limited to the following:
 - 1. Associated Concrete Products, Inc. (Santa Ana, California) (Tel. 714-557-7470).
 - 2. Brooks Products Inc. (El Monte, California) (Tel. 818-443-3017).
 - 3. Christy Concrete Products, Inc. (Fremont, California) (Tel. 800-486 7070).

2.02 MANHOLES

- A. General: Size, shape, configuration, depth, etc. of manhole and frame and cover shall be as indicated.
- B. Portland Cement Concrete and Reinforcing:
 - 1. Cast-In-Place Portion: Use Class A Concrete per Caltrans Standard Specification Section 90, and ASTM A615 Grade 60 reinforcing steel bars.
 - 2. Precast Portion: ASTM C 478. Rate for AASHTO H20 loading in traffic areas.
- C. Frames and Covers: As indicated and in accordance with Caltrans Standard Specification Section 75-2.
- D. Steps: ASTM C 478 or AASHTO M 199. Manufacture from deformed, ½-inch steel reinforcement rod complying with ASTM A 615 and encased in polypropylene complying with ASTM D4101. Include pattern designed to prevent lateral slippage off step. Acceptable manufacturer is Hanson Concrete Products, (Milpitas, CA) (Tel 408-262-1091) or equal.
- E. Force Main Piping Access Openings:
 - 1. General: As indicated.

2.03 JOINT SEALANT FOR STRUCTURES AND MANHOLES

- A. Mortar: Caltrans Standard Specification Sections 51-1.02F and 51-1.03E.
 - 1. Use to seal around pipes at connections to structures and manholes. Also use to seal joints between precast sections of structures and manholes.
- B. Gaskets: Preformed flexible rubber or plastic gasket.
 - 1. Rubber Gaskets: ASTM C443.
 - 2. Plastic Gaskets: Federal Specification SS-S-00210 (GSA-FSS), Type I, Rope Form; or alternate standard which may exist. Acceptable material is "Ram-Nek," as manufactured by the K. T. Snyder Company (Houston TX), or equal.

PART 3 - EXECUTION

3.01 CLEANOUT INSTALLATION

- A. General: Install as indicated.

3.02 MANHOLE INSTALLATION

- A. General: Install as indicated.

3.03 TESTING OF MANHOLES ON GRAVITY LINES

- A. At the option of the Contractor, either the following hydrostatic or vacuum test shall be performed.

B. Hydrostatic Test:

1. Insert inflatable plugs in all sewer inlets and outlets.
2. Fill the manhole with water to a point six inches below the base of the manhole frame.
3. Maintain the water at this point for one hour to allow time for absorption.
4. Begin one-hour test period. Measure the amount of water added in one-hour period to maintain the water level at six inches below the base of the manhole frame. Do not allow water level to drop more than 25% of the manhole depth.
5. Determine the allowable leakage by the following formula.
6. $L=0.0002 \times D \times H^{1/2}$
7. L = Allowable leakage, gallons per minute.
8. D = Depth of manhole from top to bottom, feet.
9. H = Head of water in feet as measured from the surface of the water in the manhole to the sewer line invert or to the prevailing ground water surface outside the manhole. The lesser height governs.
10. If the leakage exceeds the allowable, determine the cause, take remedial action and re-test the manhole. If the leakage is less than the allowable and leaks are observed, repair the leaks.

C. Vacuum Test:

1. General: Test in accordance with ASTM C 1244.
2. Test prior to backfilling around the manhole.
3. Test Preparation: Plug all lift holes and pipes entering or exiting the manhole.
4. Place test head inside the top section of the manhole's cone section and inflate in accordance with the manufacturers instructions.
5. Draw a vacuum of 10-inches of mercury and shut the pump off.
6. With the valve closed, the time for the vacuum to drop 9-inches shall be measured.
7. The manhole shall pass the test if the time is greater than 60 seconds for a 48-inch diameter manhole, 75 seconds for a 60-inch diameter manhole and 90 seconds for a 72-inch diameter manhole.
8. If the manhole fails the initial test, make necessary repairs with a non-shrink grout while the vacuum is still being drawn. Retest until a satisfactory test is obtained.

END OF SECTION

SECTION 33 40 00

STORM DRAINAGE UTILITIES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Roadway and/or site storm drainage up to 5-feet of any on-site building.

1.02 RELATED DOCUMENTS

A. AASHTO:

1. M 252: Standard Specification for Corrugated Polyethylene Drainage Pipe.
2. M 294: Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter.

B. ASTM:

1. A 74: Standard Specification for Cast Iron Soil Pipe and Fittings.
2. A 615/A615M: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
3. C 443: Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
4. C 564: Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
5. C 1173: Standard Specification for Flexible Transition Couplings for Underground Piping Systems.
6. D 1785: Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
7. D 2235: Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings.
8. D 2321: Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications.
9. D 2564: Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems.
10. D 2751: Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings.
11. D 3034: Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
12. D 4101: Standard Specification for Polypropylene Injection and Extrusion Materials.
13. F 477: Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
14. F 656: Standard Specification for Primers for Use in Solvent Cement Joints of Poly(Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
15. F 679: Standard Specification for Poly(Vinyl Chloride) (PVC) Large Diameter Plastic Gravity Sewer Pipe and Fittings.
16. F-1336: Standard Specification for Poly(Vinyl Chloride) (PVC) Gasket Sewer Fittings.

C. AWWA:

1. C104: Cement-Mortar Lining for Ductile Iron Pipe and Fittings.
2. C105: Polyethylene Encasement for Ductile-Iron Pipe Systems.

3. C110: Ductile-Iron and Gray-Iron Fittings.
 4. C111: Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
 5. C150: Thickness design of Ductile-Iron Pipe.
 6. C151: Ductile-Iron Pipe, Centrifugally Cast.
 7. C153: Ductile-Iron Compact Fittings.
 8. M41: Ductile Iron Pipe and Fittings.
- D. Caltrans Standard Specifications:
1. Section 65, Concrete Pipe.
 2. Section 66, Corrugated Metal Pipe.
 3. Section 70. Miscellaneous Drainage Facilities.
 4. Section 72, Slope Protection.
- E. Caltrans Standard Plans:
1. Plan D94A: Metal and Plastic Flared End Sections.
 2. Plan D94B: Concrete Flared End Sections.
 3. Plan D97A: Corrugated Metal Pipe Coupling Details No. 1, Annular Coupling Band Bar and Strap and Angle Connections.
 4. Plan D97B: Corrugated Metal Pipe Coupling Details No. 2, Hat Band Coupler and Flange Details.
 5. Plan D97C: Corrugated Metal Pipe Coupling Details No. 3, Helical and Universal Couplers.
 6. Plan D97D: Corrugated Metal Pipe Coupling Details No. 4, Hugger Coupling Bands.
 7. Plan D97E: Corrugated Metal Pipe Coupling Details No. 5, Standard Joint.
 8. Plan D97F: Corrugated Metal Pipe Coupling Details No. 6, Positive Joint.
 9. Plan D97G: Corrugated Metal Pipe Coupling Details No. 7, Downdrain.
 10. Plan D98A: Slotted Corrugated Steel Pipe Drain Details.
 11. Plan D98B: Slotted Corrugated Steel Pipe Drain Details.
- F. California Building Code:
- G. Section 1806A.11 – Pipes and Trenches.
- H. Section 1133B.7.2 – Gratings.
- I. California Plumbing Code.
- 1.03 DEFINITIONS
- A. AASHTO: American Association of State Highway and Transportation Officials.
 - B. ABS: Acrylonitrile-butadiene-styrene.
 - C. ASTM: American Society for Testing Materials.
 - D. AWWA: American Water Works Association.
 - E. CMP: Corrugated metal pipe.

- F. DIP: Ductile iron pipe.
- G. HDPE: High-density polyethylene.
- H. NPS: Nominal pipe size.
- I. PE: Polyethylene.
- J. PVC: Polyvinyl chloride.
- K. RCP: Reinforced concrete pipe.

1.04 SUBMITTALS

- A. Follow submittal procedures outlined in Section 01 33 00 – Submittal Procedures.
- B. Product Data Shop Drawings, Etc.: For the following:
 - 1. Piping materials and fittings.
 - 2. Special pipe couplings.
 - 3. Polymer-concrete, channel drainage systems (trench drains).
 - 4. Joint sealants.
 - 5. Plastic area drains.
 - 6. Precast concrete catch basins, inlets, curb inlets, and area drains, including frames and grates.
 - 7. Concrete, metal and plastic flared end sections.
- C. Design Mix Reports and Calculations: For each class of cast in place concrete.
- D. Field Test Reports: Indicate and interpret test results for compliance with performance.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Do not store plastic structures, pipe and fittings in direct sunlight.
- B. Protect pipe, fittings, and seals from dirt and damage.
- C. Handle precast concrete pipe and other precast structures according to manufacturer's written instructions.
- D. Protect imported bedding
- E. g and backfill material from contamination by other materials.

PART 2 - PRODUCTS

2.01 PIPING MATERIALS

- A. ABS Pipe and Fittings: Smaller than 4-inch, ASTM D 2751, SDR 35. Solvent cement joints.
 - 1. Solvent Cement: ASTM D 2235.
- B. ABS Pipe and Fittings: 4-inch through 12 inch, ASTM D 2751, SDR 35. Bell and spigot joints.
 - 1. Bell and Spigot Joint Gasket: Elastomeric seal, ASTM F 477.
- C. Cast Iron Pipe and Fittings: Hub and spigot, 2-inch through 15-inch, ASTM A74, service class.
 - 1. Gaskets: ASTM 564, rubber, compression type, thickness to match class of pipe.

- D. Corrugated Metal Pipe: Caltrans Standard Specification Section 66.
 - 1. Bituminous Coating: Caltrans Standard Specification Section 66-1.02C.
 - 2. Bituminous Lining: Caltrans Standard Specification Section 66-1.02C.
 - 3. Bituminous Pavings: Caltrans Standard Specification Section 66-1.02C.
 - 4. Corrugated Aluminum Pipe: Caltrans Standard Specification Section 66-1.02F.
 - 5. Corrugated Steel Pipe: Caltrans Standard Specification Section 66-1.02E.
 - 6. Slotted Corrugated Steel Pipe: Caltrans Standard Specification Section 66-2.
 - 7. Details: Caltrans Standard Plans D97A, D97B, D97C, D97D, D97E, D97F, D97G, D98A and D98B.
- E. DIP: Sizes 4-inch through 48-inch.
 - 1. Pipe: AWWA C150 and C151.
 - 2. Pressure Class: Minimum pressure class for size indicated.
 - 3. Fittings:
 - (a) Standard: AWWA C110, sizes 4-inch through 48-inch.
 - (b) Compact: AWWA C153, sizes 4-inch through 24-inch.
 - 4. Pipe and Fitting Lining: Cement Mortar, AWWA C104.
 - 5. Pipe and Fitting Coating: Asphaltic, AWWA C151 or C115.
 - 6. Exterior Soil Corrosion Protection for Pipe and Fittings: Polyethylene encasement, AWWA C105.
 - 7. Joints:
 - (a) Push-On Bell and Spigot Joint: AWWA C111.
 - (b) Mechanical Joint: AWWA C111.
 - (c) Flanged joint. AWWA C115.
- F. Reinforced Concrete Pipe: Designated by Class, rubber gasketed joints.
 - 1. Circular Reinforced Concrete Pipe: Caltrans Standard Specification Section 65-2.01D(3). Class III.
 - 2. Oval shaped (Elliptical) Reinforced Concrete Pipe: Caltrans Standard Specification Section 65-2.01D(5)/2.02D. Class HE-III and VE-III.
 - 3. Reinforced Concrete Pipe Arch: Caltrans Standard Specification Section 65-1.02C.
 - 4. Rubber Gasketed Joints: Caltrans Standard Specification Section 65-2.02F.
- G. PE Pipe and Fittings: 4-inch through 10-inch, AASHTO M 252 Type S, smooth interior and corrugated exterior. Bell and spigot joints.
 - 1. Bell and Spigot Joint Gasket: Elastomeric seal, ASTM F 477.
 - 2. Couplings: AASHTO M 252, corrugated band type. Engage a minimum of 4 corrugations, 2 on each side of pipe joint.

- H. PE Pipe and Fittings: 12-inch through 48-inch, AASHTO M 294. Type S, smooth interior and corrugated exterior. Bell and spigot joints.
 - 1. Bell and Spigot Joint Gasket: Elastomeric seal, ASTM F 477.
 - 2. Couplings: AASHTO M 252, corrugated band type. Engage a minimum of 4 corrugations, 2 on each side of pipe joint.
- I. PVC Pipe and Fittings-Smaller than 4-Inch: ASTM D1785, Schedule 40.
 - 1. Joints: Solvent Cement, ASTM D 2564. Include primer according to ASTM F656.
- J. PVC Pipe and Fittings, 4-Inch and Larger
 - 1. Pipe:
 - (a) 4-inch through 15-inch: ASTM D 3034, SDR 35. Bell and spigot joints.
 - (b) 18 inch through 36-inch: ASTM F 679, T-1 wall. Bell and spigot joints.
 - 2. Fittings:
 - (a) 4-inch through 27-inch: ASTM F 1336.
 - (b) 30-inch through 36-inch: ASTM D 3034, SDR 35
 - 3. Joint Gasket: Elastomeric seal, ASTM F 477.

2.02 PIPE ANCHORS

- A. Section 32 05 23 – Cement and Concrete for Exterior Improvements.

2.03 SPECIAL PIPE COUPLINGS

- A. Plastic, Cast Iron and Ductile Iron Pipe: ASTM C 1173, rubber or elastomeric sleeve and band assembly fabricated to match outside diameters of pipes to be joined.
- B. Reinforced Concrete Pipe: Portland cement concrete collar as indicated.
- C. Section 32 05 23 – Cement and Concrete for Exterior Improvements.

2.04 CURB INLETS, CATCH BASINS, DROP INLETS, AREA DRAINS, ETC.

- A. General: Size, shape, configuration, depth, etc. of structure and frame, grate, or cover shall be as indicated.
- B. Section 32 05 23 – Cement and Concrete for Exterior Improvements.
- C. Precast Structure: Rate for AASHTO H20 loading in paved areas.
- D. Steps: ASTM C 478 or AASHTO M 199. Manufacture from deformed, ½-inch steel reinforcement rod complying with ASTM A 615 and encased in polypropylene complying with ASTM D4101. Include pattern designed to prevent lateral slippage off step. Acceptable manufacturer is Hanson Concrete Products, (Milpitas, CA) (Tel 408-262-1091).
- E. Frames, Grates and Covers: Caltrans Standard Specification Section 75-2, 75-3 and 75-1.02B.
 - 1. Galvanize steel frames, grates and covers.
 - 2. Grates and covers shall be non-rocking, bolt-down type.
 - 3. Rate for AASHTO H20 loading in paved areas.

2.05 MANHOLES AND CLEANOUTS

- A. See Section 33 05 16 – Utility Structures.

2.06 POLYMER-CONCRETE TRENCH DRAINS

- A. General: Modular system of precast, polymer-concrete channel sections, grates, and appurtenances; designed so grates fit into channel recesses without rocking or rattling. Include number of units required to form total length required.
- B. Include the following components:
 - 1. Channel Sections: Interlocking-joint, precast modular units with end caps. Inside width as indicated with deep, rounded bottom, with built in slope or flat invert as indicated and outlets in number, sizes, and locations indicated. Include extension sections necessary for required depth.
 - 2. Frame and Grate: Gray iron, ductile iron or galvanized steel as indicated. Where drain is located in traffic areas, rate for AASHTO H20 loading.
- C. Locking Mechanism: Manufacturer's standard device for securing grates to channel sections.
- D. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Project include, but are not limited to, the following:
 - 1. "Polydrain" by ABT Inc. (Troutman, NC) (Tel 704-528-9806).
 - 2. "ACO Drain" by ACO Polymer Products Inc. (Chardon, OH) (Tel. 800-543-4764).

2.07 METAL, CONCRETE OR PLASTIC FLARED END SECTIONS

- A. General: Caltrans Standard Specification Section 70-5.02 and Caltrans Standard Plan D94A and D94B.

2.08 SLOPE PROTECTION

- A. Rock Slope Protection: Caltrans Standard Specification Section 72-2.02.
 - 1. Class: *[Select Class applicable to the Project.]*
 - 2. Fabric: Caltrans Standard Specification Section 72-2.02C.
- B. Concrete/Shotcrete Slope Protection: Caltrans Standard Specification Section 72-5.02.
 - 1. Bar Reinforcement: Caltrans Standard Specification Section 52-1.02B, minimum Grade 40.
 - 2. Welded Wire Fabric: Caltrans Standard Specification Section 52-1.02C. Use 6 x 6-W1.4 xW1.4 unless otherwise indicated.
- C. Concreted-Rock Slope Protection: Caltrans Standard Specification Section 72-3.02.
 - 1. Class: *[Select Class applicable to the Project.]*
- D. Sacked Concrete Slope Protection.
 - 1. Concrete: Caltrans Standard Specification Section 90, Class 3.
 - 2. Sacks: 10 ounce burlap measuring approximately 19.5-inches by 36 inches when empty and laid flat.

2.09 CONCRETE/SHOTCRETE DITCH LINING

- A. General: Caltrans Standard Specification Section 72-5.02.
 - 1. Bar Reinforcement: Caltrans Standard Specification Section 52-1.02B, minimum Grade 40.
 - 2. Welded Wire Fabric: Caltrans Standard Specification Section 52-1.02C. Use 6 x 6-W1.4 xW1.4 unless otherwise indicated.

PART 3 - EXECUTION

3.01 PIPE INSTALLATION

- A. General: Install pipe, fittings, and appurtenances utilizing best practices, manufacturer's instructions, and in accordance with Section 6 and 7 of ASTM D 2321 for plastic pipe, Caltrans Standard Specification Section 65-2.03C for reinforced concrete pipe, Caltrans Standard Specification Sections 66-1.045 and 66-105 for corrugated metal pipe and chapter 11.3.3 of AWWA M41 for cast iron and ductile iron pipe.
- B. Pipe Depth and Trench Configuration: Conform to typical trench section(s) indicated.
- C. Excavation, Bedding, Backfill, and Compaction: Section 31 23 33 – Trenching and Backfilling.
- D. Handling: Carefully handle during loading, hauling, unloading and placing operations to avoid breakage or damage. Use strap type slings for lifting and placing; no chains or hooks will be permitted. Comply with manufacturer's recommendations.
- E. Laying: Before lowering pipe into the trench, remove all stakes, debris, loose rock and other hard materials from the bottom of the trench. Lay accurately in conformance with lines and grades indicated. Start laying the pipeline at the low end and proceed upstream. Lay bell and spigot pipe with the bell end facing upstream. Lay pipe on a bed prepared by handwork, dug true to grade. Furnish firm bearing for pipe throughout its entire length with bell holes provided at the ends of each pipe length of sufficient size to permit making up the particular type of joint being used. Adjust pipe to line and grade by scraping away or filling and tamping material under the body of the pipe for the entire pipe length and not by blocking or wedging. After final positioning, hold pipe in place in trench with backfill material placed equally on both sides of the pipe at as many locations as required to hold the pipe section in place.
- F. Curved Alignment: When necessary to conform to the alignment specifically indicated, lay pipe on a curved alignment by means of asymmetrical closure of joints or bending of the pipe barrel. Use shorter lengths of pipe than the standard length if necessary to achieve curvature specified. Do not exceed the recommendations of the pipe manufacture for deflections at the joints or pipe bending.
- G. Closure: Close open ends of pipes and appurtenance openings at the end of each days work or when work is not in progress.

3.02 INSTALLATION OF PIPE ANCHORS

- A. Install at location, configuration and details shown on the Plans.

3.03 SPECIAL PIPE COUPLINGS

- A. General: Use where required to join piping and no other appropriate method is specified. Do not use instead of specified joining methods.
- B. Installation: Per manufacturer's instructions.

3.04 INSTALLATION OF CURB INLETS, CATCH BASINS, DROP INLETS, AREA DRAINS, ETC.

- A. Excavation, Bedding, Backfill, and Compaction: Section 31 23 33 – Trenching and Backfilling.
- B. Poured in Place Structures: Install as indicated and Caltrans Standard Specification Section 51.
 - 1. Shape bottoms to convey flows as indicated.
- C. Precast Structures: Install as indicated.
 - 1. Seal all joints and pipe entrances and exits.
 - 2. Place concrete in bottom and shape to convey flows as indicated.

3.05 POLYMER-CONCRETE TRENCH DRAIN INSTALLATION

- A. Excavation, Bedding, Backfill, and Compaction: Section 31 23 33 – Trenching and Backfilling.
- B. Install: As indicated and in accordance with the manufacturer's instructions.

3.06 CONCRETE OR PLASTIC FLARED END SECTION INSTALLATION

- A. Install: As indicated.

3.07 SLOPE PROTECTION PLACEMENT

- A. Rock Slope Protection: Caltrans Standard Specification Section 72-2.03C and as indicated.
1. Use Method B Placement unless otherwise indicated. If Method A is used, then refer to Caltrans Standard Specification Section 72-2.03B
- B. Concrete/Shotcrete Slope Protection: Caltrans Standard Specification Section 72-5.03.
- C. Concreted-Rock Slope Protection: Caltrans Standard Specification Section 72-3.03A and 72-3.03E.
1. Use Method B Placement unless otherwise indicated. If Method A is used, then refer to Caltrans Standard Specification Section 72-3.03B.
- D. Sacked Concrete Slope Protection.
1. Detailed configuration: As indicated.
 2. Use one cubic foot of concrete per sack.
 3. Locate headers and stretchers as indicated.
 4. Headers: Folded end to bank.
 5. Stretchers: Folded ends are not to be adjacent.
 6. Place no more than four vertical courses until initial set has taken place in first course.

3.08 CONCRETE/SHOTCRETE DITCH LINING PLACEMENT

- A. Concrete/Shotcrete Slope Protection: Caltrans Standard Specification Section 72-5.03.

END OF SECTION

PART 5 – PERMITS



December 13, 2022

SENT VIA EMAIL

WLC Architects Inc.

Omar.eslava@pbk.comLoren.gachen@pbk.com

RE: H Park Honeybee Pool
SR0018578

Dear WLC:

Plans are **APPROVED** contingent upon the following:

- 1) Obtain local Building Department and all applicable agency permits and approvals prior to construction and operating pool.
- 2) If applicable, provide updated California Department of Public Health (CDPH) AB1020 form to Environmental Health.
- 3) Environmental Health and Safety approved plans shall be maintained at the jobsite when constructing.
- 4) Changes to plans, equipment, or application must be submitted for approval.
- 5) If applicable; all pumps, filters, chemical feeders, skimmers and supplemental equipment shall comply with the applicable requirements established by the NSF/ANSI 50-2012 performance standard effective September 2012.
- 6) All suction outlets shall be equipped with suction fittings that meet the ANSI/APSP-16 2011 performance standard.
- 7) The pool owner, operator or designated agent shall notify the enforcing agent prior to scheduling the following inspections:
 - a. Prior to applying the final surface to the pool shell; and
 - b. At the completion of construction.
- 8) At the final pool inspection, proper pool enclosure, water chemistry, and turnover shall be provided in accordance with all applicable codes.

No pool shall be opened to the public without the written approval of the enforcing agent.

Facility must obtain a valid health permit prior to operating. If you have any questions regarding this letter, please email me at Phillip.McCauley@sonoma-county.org or call (707) 565-4508.

Sincerely,

Phil McCauley, REHS
Supervising Environmental Health Specialist
County of Sonoma, Environmental Health



Environmental Health ❖ 625 5th Street, Santa Rosa, CA 95404 ❖ 707-565-6565 ❖ EH@sonoma-county.org
<https://sonomacounty.ca.gov/Health/Environmental-Health-and-Safety/>

APR 21 2022

ENVIRONMENTAL HEALTH AND SAFETY

POOL/SPA FACILITY PLAN REVIEW APPLICATION

TYPE OF POOL (please submit one application per body of water): POOL SPA WADER SPRAY GROUND SPECIAL PURPOSE
 NEW REMODEL EQUIPMENT CHANGE DECK/FENCE

FACILITY NAME ~~Honeybee Pool~~ **H Park Honeybee Pool** APN (if known): **143-280-42 & 62**
 Site Address ~~4470 Golf Course Drive~~ **1200 Golf Course Dr** Ste # _____ City **Rohnert Park** Zip **94928**

OWNER NAME ~~Tomie Zwillinger/City of Rohnert Park~~ Phone **707-588-3331** Email Address **tzwillinger@rpcity.org**

Mailing Address **600 Enterprise Drive** Ste # _____ City **Rohnert Park** State **CA** Zip **94928**

DESIGNER / CONTRACTOR **WLC Architects Inc.** Phone **510-450-1999**

Mailing Address **2600 Tenth Street, Suite 500** Ste # _____ City **Berkeley** State **CA** Zip **94710**

Email Address **Omar.eslava@pbk.com; Loren.Gachen@pbk.com** State Contractor's License number (if applicable): _____

SCOPE OF WORK: **See attached.**

POOL / SPA INFORMATION			
YEAR BUILT:	1986		
SURFACE AREA (sq. ft.):	4,350		
VOLUME (gallons):	152,000		
MAIN DRAIN:	<input type="checkbox"/> New split 3ft. apart <input checked="" type="checkbox"/> Existing split 3ft. apart <input type="checkbox"/> Single main drain with anti-entrapment device		
PIPE SIZE(S) (inches):	Suction Line: 6"	Return Line: 6"	
EQUIPMENT		EXISTING	
FILTER:	Make and Model:	(2) Pentair R72	NEW N/A
	Type/Size (sq. ft.):	(2) High rate Sand/ 20	
PUMP(S):	Make and Model:	Pentair C Series CHK-100	
	H.P.:	10	
DISINFECTANT:	Make and Model:	12.5 % Cl2	
	Type:	FlexPro A3V	
FLOWMETER:	Make and Model:	+GF+ Sygnet Flowmeter P/N- 385501	

Water Supply: Public Private Well* Sewage Disposal: Public On-Site/Septic** Name of Water System **City of Rohnert Park**
 *CDPH Drinking Water Branch clearance is required prior to issuance of permits
 **Permit Sonoma clearance is required prior to issuance of permits

I understand that these plans will be approved / not approved within 20 working days after being submitted to Environmental Health. Plan approval requires submittal of all necessary information that is in conformance with applicable laws and regulations. Plan review and construction inspection fees (including travel time) are separate from the operational permit fee. Plan review fees are a prepaid estimate of time and are based on the current hourly rate. It is the applicant's responsibility to obtain all necessary building permits. Approved plans from Environmental Health are required by the Building Department prior to issuing a building permit for any construction/renovation of a pool/spa or ancillary facility. Before opening the public pool, the following must be completed:

- Any additional time beyond the initial paid plan review fees will be due prior to submittal of a permit application.
- Prior to opening, all final construction approvals/inspections must be obtained and the operational permit application and fee must be submitted.
- Approval by all applicable agencies must be obtained.

If a pool facility opens without a valid Public Pool Permit, the operator may be subject to penalties and closure of the facility.

Applicant Signature *Terie Zwillinger* Date 3-11-22
 Print Name TERIE ZWILLINGER Title CIP PROGRAM MANAGER

For office use only:
 Application Date 4.21.22 FA# FA0002458 SR# SR0018578 Dist 2
 Comments: Flow Rate = 422-516 GPM
 Plans Reviewed by BH Date 5/9/2022 Plans Approved by PM Date 12/13/2022
 Cash Check/Credit Card Trans# _____ Date rec'd _____ by _____ Amount rec'd \$ _____

4/21/2022 2:52 PM Sales Receipt #19482
Store: 4 Workstation: 2

Sonoma County Env Health & Safety
625 Fifth Street
Santa Rosa, CA 95404
(707) 565-6565

Cashier: EHCounter

Item Name	Qty	Price	Ext Price
114405 Rec/Pools	1	\$436.00	\$436.00
		Subtotal:	\$436.00
Local Sales Tax		0 % Tax:	+ \$0.00
		RECEIPT TOTAL:	\$436.00

Check: \$436.00 1270

Honeybee Pools

IN0135511 EP

Website: <http://sonomacounty.ca.gov/>



19482

APR 21 2022

ENVIRONMENTAL
HEALTH AND SAFETYScope of WorkProject: Honeybee Pool Renovation Project, Project No. 2019-31Address: 1170 Golf Course Drive, Rohnert Park

Work is comprised of general construction including remodeling of Honeybee Pool. Work includes, but is not limited to:

- Pool refinishing.
- ADA access to pool lift.
- Handrail to pool stair.
- Pool decking replacement exceeding 2% at restrooms at path of travel to restrooms, concession and pool lift area, move ADA lift to other side by the lifeguard stand.
- Remove existing drinking fountain and install ADA drinking fountain.
- Sidewalk repairs.
- Replace perimeter fence and entry gates.
- Removal of existing wading pool, and replace with concrete pavers.
- Replace sidings and trims at restrooms and privacy screens.
- At concession buildings, dry rot repairs and replacement of sheathing and framing, and exterior painting of exterior trims.
- Women's and men's restrooms ADA improvements including stud walls, gypsum board, floor and wall finishes, toilet partitions, removal and installation of plumbing fixtures, shower pans, folding shower and dressing seats, folding baby changing stations, toilet accessories, replace doors and door frames.
- Remove existing overhead coiling door and install overhead coiling service counter door, fix counter height to be ADA compliant, sliding window, laminate-clad wood casework, ADA signages, graphics, exhaust fan replacements, and roof repairs, light fixtures, and all mechanical and electrical work affected by the ADA improvement work. Remove and replace 2 furnaces and 2 thermostats at the Ladybug Park Clubhouse.

Existing Equipment List:

Equipment	Manufacturer	Model/Description
Heater	Xtherm	Model I P7-1505A, Type P
Filter (2)	Pentair	Model R72 Stark Highrate sand, 344 GPM per filter, Filtration Area: 17.2 sqft.
Pump	Pentair	CHK-100, C Series, 10 HP
Flow Meter	Signet	+GF+ PN- 385501
Acid Pump	Flexflo	A1N10A-ST
Chlorine Pump	Flexpro	A3V24-SNK
pH and Chlorine Read	Rosemount	Model S6,E04,E05 &506 Comprise and automatic chlorination system



December 14, 2022

BY E-MAIL

Terrie Zwillinger
600 Enterprise Dr.
Rohnert Park, CA 94928

RE: H Park Honeybee Pool (Concession Area Project)
1200 Golf Course Dr, Rohnert Park
SR0018862 (old number SR0018578 was incorrect)

Dear Ms. Zwillinger:

Plans are approved contingent upon the following:

- 1) Install a commercial back flow prevention faucet on the janitorial sink.
- 2) All food equipment must be certified to applicable sanitation standards by an ANSI accredited testing agency (e.g. NSF, ETL Sanitation, UL EPH, etc.).
- 3) Obtain local Building Department and all applicable agency permits and approvals.
- 4) EH stamped approved plans shall be maintained at the jobsite.
- 5) Changes to equipment layout, menu, or application must be submitted for approval. EH may require as-built record drawing to reflect any changes made to the final construction of the facility that are not reflected on the EH approved plans.
- 6) The food facility must be fully enclosed. Seal all cracks, gaps, and holes in the food facility to prevent the entrance and harborage of animals, birds, and vermin.
- 7) Floor sinks shall be installed ½ exposed and equipped with a safety cover if no access is provided for cleaning. Drain lines will terminate above the floor sink with a minimum 1-inch legal air gap.
- 8) Conduits of all types shall be installed within walls as practicable. When otherwise installed, they shall be mounted or enclosed in a chase to facilitate cleaning.
- 9) Seal all cracks, gaps and crevices in counters, cabinets, around metal flashing, sink backsplashes, around pipes and conduits with an approved sealant.
- 10) At the final inspection, all utilities and equipment must be in place and functional. Refrigeration units shall have an ambient air temperature of 38°F or below and shall be equipped with a thermometer accurate to +/- 2°F in the warmest section of the unit. Hot water to be a minimum 120°F to faucets. Handwashing sinks to have warm water between 100°F and 108° F under

pressure for a minimum of 15 seconds. All soap and paper towel dispensers should be filled
Backflow devices shall be initially tested upon installation by a certified tester.

11) Additional plan check hours, if any, may be invoiced at EH's current hourly rate after EH grants final construction approval.

Call (707) 565-6538 at least 5 business days in advance to schedule a final construction inspection.

Sincerely,

A handwritten signature in cursive script that reads "Jennifer Lyle".

Jennifer Lyle, REHS
Senior Environmental Health Specialist

C Kelsey Bracewell, City of Rohnert Park

PART 6 – DRAWINGS
