Verdugo Woodland Elementary School

Playground Shade Structure

Prepared by Architecture 9 PLLLP

Architecture 9 PLLLP

SPECIFICATIONS

Project:	Verdugo Woodland Elementary School Playground Shade Structure
District:	Glendale Unified School District GLENDALE UNIFIED SCHOOL DISTRICT 223 North Jackson Street Glendale, California 91206
Architect:	Architecture 9 PLLLP 8816 Foothill Boulevard #103-224 Rancho Cucamonga, California 91730

Steven M. Gelsinger
Architect

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ARCHITECTURAL SPECIFICATIONS

GLENDALE UNIFIED SCHOOL DISTRICT
VERDUGO WOODLAND ELEMENTARY SCHOOL
PLAYGROUND SHADE STRUCTURE

JULY 1, 2018

END OF SECTION

PART 1 - GENERAL

1.01 WORK OF THE CONTRACTOR:

A. Scope of Work: Contractor shall perform, within the time stipulated, the Contract, including all of its component parts, and everything required to be performed, and to provide and furnish any and all of the labor, materials, tools, expendable equipment, and all applicable taxes, and all utility and transportation services necessary to perform the Contract and complete, in a workmanlike manner, all of the Work required in connection with the following titled Project in strict conformity with the Contract Documents:

VERDUGO WOODLANDS ELEMENTARY SCHOOL
Playground Shade Structure
1751 Verdugo Road
Glendale, California 91208

B. Phasing: Refer to Section 01 11 25 Phasing for Project Phasing Requirements, including milestones.

C. This school is on a traditional school year calendar, August through June. During the period of this contract, school events and educational requirements will limit or prevent access, and will affect Contractor work hours for a portion or all of the school building (s) pertinent to the contract. Contractor shall maintain schedule with full knowledge of these times and dates to be determined. A site-specific calendar will include currently known dates of limited access, or times of the school day that noise will have to be limited, or ceased. These shall include during the time of the project, but not be limited to:

1. No work after 6:00 p.m. on six (6) weekday evenings for back-to-school, open house, and other events per school year at each school site.
2. No work between 8:00 a.m. and 10:00 a.m. on five (5) student attendance weekdays for assembly events per school year.
3. NO NOISE/WORK will be allowed on an Elementary school site between 8:00 a.m. and 12:30 p.m. on twelve (12) student attendance weekdays for testing (four (4) consecutive weekdays, three times) per school year. Second shift work may be accommodated with the request pre-approved by the District Project Manager.
4. NO NOISE/WORK will be allowed on a Middle School or High School site between 8:00 a.m. and 1:30 p.m. on twenty (20) student attendance weekdays for testing (four (4) consecutive weekdays during the first semester; sixteen (16) consecutive weekdays during the second semester) per school year. Second shift work may be accommodated with the request pre-approved by the District Project Manager.

D. It shall be noted that there are students in the Early and Extended Education Learning Program in attendance on the Elementary school sites from 6:00 a.m. through 6:00 p.m. on a daily basis throughout the school year, and on each day that Classified Staff are assigned working hours (see specific EEELP calendar for each site, per each school year).

E. Work hours for the Project shall be from 7:00 a.m. until 10:00 p.m. Monday through Saturday, unless advance permission to deviate from these hours is obtained from the City of Glendale per Glendale Municipal Code, Title 8, Chapter 36, and this request is also approved in writing five working days beforehand by the District Project Manager.

F. Article 3 of the Bid General Conditions requires preparation of a Cost-loaded time logic schedule with a single critical path. If the Board approved lowest responsive and responsible bid Contractor and the Project Manager, on behalf of the District, cannot agree on the contract construction schedule and the project single critical path within fifteen (15) days after Notice to Proceed, the District may terminate the Contract, for convenience, as outlined in the Project General Conditions. In the event this is necessary, compensation to the General Contractor and all subcontractors or material men shall be limited to Mobilization costs only.

G. The liquidated damages shown in the Supplementary General Conditions shall apply to each phase of the phased construction plan, as defined by and within the plans and specifications.

H. No warranties or guarantees shall go into effect, for any trade, regardless of when completed in the sequence of the project erection, until one (1) day after the Board of Education has accepted the project at a noticed meeting. Attention: Bidders. This will require certain trades to bid for, and provide, a warranty of longer than one (1) year in length from the time of installation or furnishing of their materials to the project, depending upon the sequencing of their work within the overall schedule.

I. All project close-out/punch list items, project record documents, submittals, and operations manuals and spare parts, warranties and guarantees and Contractor's Final Verified Report (DSA6) shall be reviewed and accepted prior to the Architect/District agreed upon authorization to file the Notice of Completion with the Los Angeles County Recorder.

J. In the event that any materials requiring DSA Inspection (steel, concrete, masonry grout, etc.) are manufactured in an area located more than one hundred miles (100 miles) by air radius from the project site, all round-trip travel and all per diem costs incurred by the District on behalf of the Deputy Inspector who must perform on-site examination of the materials shall be borne 100% by the Contractor as an added expense. This charge shall be subtracted from the monthly "Application for Payment" submitted to the District on behalf of the project.

K. In the event the General Contractor or any subcontractor or material man (on or off site) voluntarily accelerates the schedule for their own purposes, and/or voluntarily performs work in excess of eight (8) hours per day, or on the weekends or holidays, the additional cost of the Inspectors' overtime premiums which are required to inspect the work during these hours shall be paid 100% by the Contractor. This charge shall also be subtracted from the monthly "Application for Payment" submitted to the District on behalf of the project.

L. In the event that the Contractor fails to complete all punch list items and turn over all "deliverables, warranties, As-builts, etc." within sixty (60) days after acceptance of completion by the Board of Education, the full salary costs of one (1) construction Project Manager (16 hours per week @ $120.00/hour) and one DSA Inspector of record (actual hours spent @$80.00/hour) shall be backcharged to the Contractor, in addition to the liquidated damages, if any, imposed upon the Contractor for late performance. THIS PARAGRAPH WILL BE STRICTLY ENFORCED.

M. The submission of complete project record documents, as required by the specifications, is critical. A value of Thirty Thousand Dollars ($30,000.00) shall be assigned to these record documents within the Schedule of Values and will not be paid or released until the documents are approved by the Architect and turned over to the District's Administrator of Planning, Development and Facilities.

N. The intent of these contract documents is that the work of alteration, rehabilitation or construction is to be accordance with Title 24, California Code of Regulations. Should any existing conditions such as deterioration or non-complying construction be discovered which is not covered by the Contract Documents wherein the finished work will not comply with Title 24, California Code of Regulations, a change order, or a separate set of plans and specifications, detailing and specifying the required repair work shall be submitted to and approved by DSA before proceeding with the repair work.

1.02 RELATED WORK BY DISTRICT:

A. General: All such work indicated in Contract Documents and/or specified herein.

B. Coordination:
   1. Contractor shall schedule and coordinate Owner work with his work; give 5 days min. advance notice of all dates; verify that Owner work has been accomplished prior to beginning his work

C. Owner-Furnished Items or Products (IF ANY):
   1. Owner Responsibilities:
      a. Delivery of items or products to site.
      b. Schedule delivery date with supplier in accord with Contractor's schedule.
      c. Obtain installation drawings and instructions.
      d. Submit claims for transportation damages.
      e. Arrange guarantees, warranties.
   2. Contractor's Responsibilities:
      a. Schedule required delivery date for each product, and inform Owner.
      b. Promptly inspect delivered products, report damaged or defective items.
      c. Unload; handle at site, including uncrating and storage.
      d. Protect from exposure to elements, from damage.
      e. Repair or replace items damaged as result of Contractor's operations.
      f. Install, connect, finish products.

D. The Contractor shall provide adequate storage within his fenced staging area, to store the equipment. The Contractor is solely responsible for the storage of this equipment within his staging area and all subsequent movement of this equipment. The Contractor shall be solely responsible for the maintenance and protection of all material.

E. Bidders submitting under this Contract shall include the price for all necessary coordination with the District and the equipment manufacturer, as required for proper and complete coordination between all trades and all Contractors, within their bid.

1.03 WORK BY OTHERS

A. The District reserves the right to do other work in connection with the project or adjacent thereto by contract or otherwise, and Contractor shall at all times conduct the work so as to impose no hardship on District or others engaged in District's work nor to cause any unreasonably delay or hindrance thereto.

B. Where two or more Contractors are employed on related or adjacent work, each shall conduct their operation in such a manner as not to cause delay or additional expense to the other.

C. Contractor shall be responsible to others engaged in the related or adjacent work for all damage to work, to persons, or for loss by failure to finish the work within the specified time for completion. Contractor shall coordinate his work with the work of others so that no discrepancies shall result in the project.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION

A. Product List

1. Within ten (10) working days after date of Contract, submit to the Architect five (5) copies of complete lists of all products which are proposed substitutions and those proposed as "or equal:" to products specified, and in accordance with Contract documents.
2. For products specified only by reference standards, select any product meeting standards, by any manufacturer.
3. For products specified by naming several products or manufacturers, select any products and manufacturer named.

1.02 SUBSTITUTIONS

A. Requests for substitutions shall be made only in writing on the "SUBSTITUTIONS REQUEST" form attached with all blanks completed except those reserved for the Design Consultant. All substitution requests shall be made by the Contractor.

B. In connection with the use of any substitute item approved by the Architect it shall be the Contractor's responsibility to see that such items meet all space requirements, and that any alterations to connecting items necessitated by use of the alternate items are properly made, at no increase in cost to the District.

C. In making request for substitutions, Bidder/Contractor represents that:

1. He has investigated the proposed products or method and determined that it is equal or better in all respects to that specified and that it fully complies with all requirements of the Contract Documents.
2. He will meet all contract obligations with regards to this substitution;
3. He will coordinate installation of accepted substitutions into the work, making all such changes and any required schedule adjustments, at no additional cost to the District, as may be required for the work to be completed in all respects;
4. He waives all claims for additional costs and additional time related to substitutions which consequently become apparent. He also agrees to hold the District and Architect harmless from claims for extra costs and time incurred by other subcontractors and suppliers, or additional services which may have to be performed by the Architect, for changes or extra work that may, at some time or date, be determined to be necessary in order for the work to function in the manner intended in the Contract Documents.
5. He shall provide the same warranty and guarantee, and perform any work required in accordance therewith, for the substitution that is applicable to the specified item for which the substitution is requested;
6. Material shall be installed, handled, store, adjusted, tested, and operated in accordance with the manufacturer's recommendation and as specified in the Contract Documents.

7. In all cases, new materials shall be used unless this provision is waived by written notice from the Architect or unless otherwise specified in the Contract Documents; and
8. All material and workmanship shall in every respect be in accordance with and in conformity with approved modern and accepted industry practices, and shall conform to all applicable codes, regulations, laws, ordinances, and Contract Documents.

1.03 DESIGN PROFESSIONAL OPTIONS

A. The Architect will be sole judge of acceptability of any proposed substitutions, and only approved substitutions that are accepted in writing may be used on contract work.

B. Each request for substitution approval shall include:
1. "Substitution Request" form with all required data completed, and accompanying specifications, etc., in triplicate.
2. Identity of product for which substitution is requested; include specifications page and paragraph number.
3. Identity of substitution; include complete product description, drawings, photographs, performance and test data, and any other information necessary for evaluation.
4. Quality and technical specification comparison of proposed substitution with specified products.
5. A description of changes required in other work because of substitution.
6. Effect on construction progress schedule.
7. Cost comparison of proposed substitution with specified product.
8. Any required license fees or royalties.
9. Availability of local maintenance service within a 50 mile air radius of the project.
10. Source of replacement material or spare parts; if necessary, within a 50 mile air radius of the project.

1.04 SUBSTITUTION REQUESTS DURING BIDDING PERIOD

No request for substitution approval will be considered unless written request in triplicate has been submitted on the "Substitution Request" form included herein, and has been received by the Architect at least ten (10) working days prior to bid opening date. The Architect will issue addenda prior to bid opening listing all approved substitutions, should there be any approved.

1.05 SUBSTITUTION REQUESTS AFTER CONTRACT AWARD

A. Approval will be granted only when:
   1. Specified product cannot be delivered without project delay, or
   2. Specified product has been discontinued, or,
   3. Specified product has been replaced by superior product, or
   4. Specified product cannot be guaranteed as specified, or
   5. Specified product will not fit within designated space, or
   6. Substitution otherwise determined by the District to be in its best interest.

B. The Contractor's request for substitution shall be accompanied by evidence documenting the reason for the substitution falls within one or more of the cases listed in A1 through A6 above.

C. A Construction Change Document authorizing substitutions and revising Contract Sum where appropriate will be issued for approved substitutions.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION - (NOT USED)

SUBSTITUTION REQUEST (in triplicate)

TO: _____

PROJECT: _____

SPECIFIED ITEM: _____
SECTION PAGE PARAGRAPH DESCRIPTION

The undersigned requests consideration for the following:

PROPOSED SUBSTITUTION: _____

STATE THE REASON(S) FOR PROPOSED SUBSTITUTION: (REASON MUST CONFORM TO ONE OR MORE CASES LISTED IN PARAGRAPH 1.05 A1 THROUGH 1.0A6.)

_____

_____

_____

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the request and applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents which the proposed substitution will require for its proper installation.

The undersigned certifies that the following paragraphs, unless modified by attachments are correct:

1. The proposed substitution does not affect dimensions shown on drawings:
2 The undersigned will pay for changes to the building design, including Architect's and engineering design, detailing, and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule or specified warranty requirements.
4. Maintenance and service parts will be locally available (<50 miles from project) for the proposed substitution.

The undersigned further states that the function, appearance, and quality of the proposed substitution are equivalent or superior to the specified item.

Submitted by:

Signature: _____

Firm: _____

Address: _____

_____

Date: _____

Telephone: _____

For use by the Architect:

☐ Accepted ☐ Accepted as noted

☐ Not Accepted ☐ Received too late

By: _____

Date: _____

Remarks: _____

_____

Attachments: _____

_____

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Procedure for requesting clarification of the intent of the Contract Documents.

1.02 RELATED SECTIONS

A. Section 01 11 00: Summary of the Project

B. Section 01 32 16: Schedules and Reports

C. Section 01 77 00: Project Closeout

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.01 PROCEDURE

A. Contractor shall prepare a Request for Information on the form provided and approved by the Architect and District. Prior to the submission of any RFI Contractor is responsible for thoroughly reviewing all contract documents to insure that the answer to the question is not contained therein. Contractor shall transmit the Request for Information to the Architect and Construction Manager with any supporting information.

B. Contractor shall maintain a log of all RFI's that he submits to the Architect on a weekly basis at the weekly project meetings. RFI's shall be identified with a sequential number and be dated. Reference your company's name and the name of the subcontractor asking the question, if applicable, as well as the scope of work.

C. RFI question and location shall be specific and clear. Indicate reference to construction documents sheet and detail number, as well as specification section.

D. ARCHITECT response is a clarification of the intent of the Contract Documents and does not authorize changes in the Contract Amount, Milestones and/or Contract Time.

E. A Request for Information may be returned with a stamp or notation "Not Reviewed", if, in the opinion of ARCHITECT:
   1. The requested clarification is ambiguous or unclear to ARCHITECT.
   2. The requested clarification is equally available to the requesting party by researching and/or examining the Contract Documents.
   3. Prime Contractor has not reviewed the Request for Information prior to submittal to Architect.

F. Allow a minimum of seven (7) calendar days for review and response time, after receipt by ARCHITECT. Architect will forward response to Contractor and Project Manager and DSA Inspector.

END OF SECTION

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Coordination of Work of Contract.

1.02 RELATED REQUIREMENTS

A. General Conditions

B. Section 01 73 29 - Cutting and Patching

C. Section 01 31 19 - Project Meetings

D. Section 01 33 00 - Shop Drawings, Product Data and Samples

E. Section 01 25 13 - Substitutions and Product Options

F. Section 01 77 00 - Contract Closeout

1.03 SUBMITTALS

A. Coordination Drawings: Submit in accordance with Section 01 33 00, as specified herein.

B. Work Plans: Submit as specified herein.

1.04 DESCRIPTION

A. Coordinate scheduling, work activities, submittals, including deferred approvals, District separate contracts and work of the various sections of Specifications in accordance with the Master Project Schedule.

B. Coordinate sequence of Work to accommodate District's separate contract and District's Occupancy as specified in Section 01 11 00.

C. Set up control procedures so that the Master Project Schedule is adhered. Contractor's responsibility is to properly notify District's Project Manager of anticipated and actual time delays. Refer to General Conditions.

D. Coordinate the Work and do not delegate responsibility for coordination to any Subcontractor.

E. Anticipate the interrelationship of all Subcontractors, District separate contracts, and their relationship with the Work

F. Resolve differences or disputes between Subcontractors concerning coordination, OR interference of Work between SECTIONS.

1.05 NOT USED

1.06 NOT USED

1.07 COORDINATION

A. General: Work of the Contract includes coordination of the entire work of the Project, from beginning of construction activity through Project close-out and warranty periods.

B. Mechanical/Electrical Requirements of General Work: Comply with applicable requirements of Division 23 Sections for Mechanical Provisions within units of General Work, and comply with applicable requirements of Division 26 for Electrical provisions within units of General Work.

C. Service Connections: Except as otherwise indicated, final connection of mechanical services to general work is defined as being mechanical work, and final connection of electrical services to general work is defined as electrical work.

D. Coordination: The Project will require close cooperation and coordination with the school site administration, the Architectural team, District Project Manager, and Contractor and Subcontractors. The Contractor shall consider all such coordination in his work inclusive, but not limited to, scheduling and proper sequencing of the Work with subcontractors and the District school site calendar and times that work cannot be, or occupied areas of the project school site that cannot be undertaken, during the entire project. In particular, the coordination of work before District's substantial completion of each project phase, and ensuring the site administration, the Architectural team, Inspector, and District Project Manager are fully advised of his activities to complete the Work in accordance with the Master Project Schedule.

E. Coordination/Engineering Drawings:

1. Contractor shall prepare and submit complete 1/4 " = 1'0" coordination drawings, Including plans, sections, details, etc., indicating the complete layout and all mechanical and electrical materials and equipment in all areas and within the ceiling spaces for new and existing conditions, including bottom of duct, pipe, conduit and elevations to allow District Architectural team to review with other Prime Trade Contractors' work that Contractor ensures will be coordinated properly.
2. Mechanical, plumbing and electrical Prime Trade Contractors shall be responsible for providing all vertical sections through floors showing structural physical restraints, architectural restraints, plenum spaces and all other physical obstructions that may affect work.
3 Electronic reproduction or photo reproduction of the project's Architectural, Structural, or MEP drawings will not be acceptable.

F. Mechanical, plumbing and electrical Prime Trade Contractors shall prepare a 1/4" sleeving layout indicating size and location of sleeves. Provide copies to applicable trades and District Architectural team.

G. Coordination/Engineering Drawings: These drawings are for the Contractor's and District's Representative's use during construction and shall not be construed as replacing any shop drawings, "as-built", or Record Drawings required elsewhere in these Contract Documents.

H. Debris Removal and Material Access: An area will be designated for debris removal and material access as agreed by the Contractor and Architectural team at the school site.

1.08 EQUIPMENT COORDINATION

A. Equipment Coordination: With respect to mechanical and electrical features of Contractor and/or District supplied equipment, complete data must be exchanged directly between the Contractor and those vendors and subcontractors involved as the progress of the Project requires. The person requesting the information shall advise when it will be required.

B. The Prime Trade Contractor's for casework and equipment are expressly required to provide large scale layout drawings for casework and equipment showing the required rough-in locations of all services (dimensioned from building features) service characteristics, and locations of studs where the location is critical to mounting or otherwise installing equipment and casework. Furnish sizes and spacing required for Mechanical and Electrical cutouts, and a complete brochure of fittings, sinks, outlets, or other information to provide complete data on the items and accessories being furnished.

C. In the event of incorrect, incomplete, delayed or improperly identified information, the entity causing the delay or error shall be responsible and pay for any modifications or replacements necessary to provide a correct, proper and new installation, including relocations required.

1.09 MEETINGS

A. In addition to progress meetings specified in Section 01 31 19, attend coordination meetings and pre-installation conferences with requisite personnel to assure coordination of Work when scheduled with the Architectural, Engineer, Inspector, or Project Manager.

1.10 COORDINATION OF SUBMITTALS

A. Schedule and coordinate submittals as required and as specified in Section 01 33 00.

B. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such materials and equipment.

C. Coordinate requests for substitutions to assure compatibility of space, of operating elements, and effect on work of other sections.

D. Prime Trade Contractors shall submit the following drawings for review and approval:
   1. Fire Alarm System: Refer to Division 28.

1.11 COORDINATION OF SPACE

A. Mechanical, plumbing and electrical Prime Trade Contractors shall coordinate use of Project space and sequence of installation of mechanical, and electrical work which is indicated diagrammatically on Drawings. Follow routings shown for pipes, ducts, and conduits as closely as practicable, with due allowance for available physical space; make runs parallel with lines of building. Utilize space efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

B. In finished areas, except as otherwise shown, conceal pipes, ducts, and wiring in the construction. Coordinate locations of fixtures and outlets with finish elements.

C. Off-Site Fabrication: Off-site fabrication is encouraged as much as possible and deliveries scheduled so materials and equipment can be installed immediately after delivery. The Contractors shall alert and advise material men of the need to hold deliveries until they are notified the materials are required on the site.

1.12 ELECTRICAL COORDINATION

A. Provide supervision, communications, and coordination necessary to meet the requirements of electrical power connection as set forth by the designated power company (e.g. Glendale Water and Power; SoCal Edison).

B. Provide reasonable and convenient staging and access areas near buildings to permit the respective Utility or its vendors or subcontractors, to install, modify or remove equipment and other components of the electrical power system furnished and installed by the designated power company.

1.13 COORDINATION OF CONTRACT CLOSEOUT

A. Coordinate completion and cleanup of work of separate sections in preparation of District school site occupancy with approval of final cleanup by the Inspector and Project Manager.

B. After District occupancy of premises, coordinate access to site by various sections for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of District/school activities.

C. Assemble and coordinate closeout submittals specified in Section 01 77 00.

1.14 NOT USED

1.15 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

A. The Drawings show, if applicable, existing above and below grade structures, drainage lines, storm drains, sewers, water, gas, electrical, hot water, and other utilities which are known to the District.

B. Locate all known existing installations before proceeding with construction operations which may cause damage to such installations. Existing installations shall be kept in service where possible and damage to them shall be repaired with no adjustment of Contract Sum. District archives as-built drawings, and Contractor shall be responsible to request to view any and all drawings for the areas that may be affected in the construction before the work begins.

C. If any unforeseen structures or utilities are encountered, request District's Architectural Team to provide direction on how to proceed with the Work.

D. If any structure or utility is damaged, take appropriate action to ensure the safety of persons and property and report the same to the District's Architectural Team, and begin immediate remediation of any safety-related condition.

PART 2 - PRODUCTS - NOT USED.

PART 3 - EXECUTION - NOT USED.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Coordinate both the listing and timing of reports and other activities required by provisions of this and other Sections, so as to provide consistency and logical coordination between the reports. Maintain coordination and correlation between separate reports by updating at monthly or shorter time intervals. Make monthly distribution of the progress schedule and update to all parties involved in the work including the Architect, Inspector, and Project Manager, along with the Request/Application for Payment. In particular provide definition and coordination of the progress schedule, with phases, changes, schedule of values, funding sources and progress reports.

B. CPM Schedule: Secure critical time commitments for performing major elements of the work of no longer than 60-day increments. Within 30 days after the Notice to Proceed, submit a comprehensive CPM chart progress schedule indicating, by stage-coded symbols, milestones for each major specification section, category, or unit of work to be performed; include minor elements of work, which are, nevertheless, involved in overall sequencing of the work. Include dates for completion of each phase of work. Arrange schedule to show graphically the major sequences of work necessary for the completion of related elements of work. Arrange the schedule to allow for the Architect's review of submittals as well as procedure for certification of substantial completion. Prepare and maintain the schedule on a sheet of sufficient width (or a series of sheets) to show the required data clearly for the entire construction time. Prepare the schedule on sheets of stable transparency, or other reproducible material, to permit reproduction for the required distribution.

C. Daily Reports: Prepare a daily report, recording the following information concerning events at the site; make available to the Inspector for on-site review and submit duplicate copies to the Inspector and Architect upon request:

1. List of Contractor personnel at the site.
2. List of Subcontractors at the site.
3. Accurate Count of personnel at the site by trade, and Subcontractor.
4. Material and Equipment Deliveries.
5. High/low temperatures, and general weather conditions.
6. Accidents or injuries.
7. Meetings and significant decisions.
8. Unusual events.
9. Stoppages, delays, shortages, losses.
10. Emergency procedures, field orders.
11. Orders/requests by governing authorities, signed.
12. Services connected, disconnected.
13. Equipment or system tests and start-ups.
14. Partial completions, occupancies.
15. Substantial completion requested.
16. Substantial completion authorized.
17. Requests for Inspections.

D. Progress Reports: Contractor shall submit "Verified Reports", on prescribed form, of construction per requirements of Title 24, CCR.

PART 2 - PRODUCTS - NOT APPLICABLE

PART 3 - EXECUTION - NOT APPLICABLE

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This section lists the abbreviations, symbols and acronyms used in these specifications.

1.02 ABBREVIATIONS:

ac	Alternating current
BTU	British thermal unit
cfh	Cubic feet per hour
cfm	Cubic feet per minute
cm	Centimeter
Co.	Company
COP	Coefficient of performance
Corp.	Corporation
d.	Penny
db.	Decibel
DB	Dry bulb
dc	Direct current
EER	Energy efficiency ratio
F	Degrees Fahrenheit
fpm	Feet per minute
gap	Gallons per hour
GPM	Gallons per minute
HP	Horsepower
HVAC	Heating, ventilating and air conditioning
Hz	Hertz
Inc.	Incorporated
KHz	Kilohertz
lb	Pound
LED	Light emitting diode
MBH	100 BTUs per hour
MHz	Mega hertz
mil	Thousandth of an inch
mm	Millimeter
mph	Miles per hour
oz.	Ounce
pH	Acidity-alkalinity balance
psf	Pounds per square foot
psi	Pounds per square inch
psig	Pounds per square inch, gauge
RF	Radio frequency
rpm	Revolutions per minute
V	Volt
WB	Web bulb
#	Number
'	Foot/Feet
"	Inch (es)
%	Percent

1.03 ACRONYMS:

ABMA	American Boiler Manufacturers Association
ABMS	American Bureau of metal Statistics
ABPA	American Board Products Association

ACI	American Concrete Institute
AGA	American Gas Association
AHAM	Association of Heating and Air Conditioning Manufacturers
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Moving and Conditioning Association, Inc.
ANSI	American National Standards Institute
APA	American Plywood Association
AQMD	Air Quality Management District
ARI	Air-Conditioning and Refrigeration Institute
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWI	Architectural Woodwork Institute
AWPA	American Wood Preservers Association
AWPI	American Wood Preservers Institute
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Institute of America
CAC	California Administrative Code
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute
CQC	California Quality Control (CMA Standards)
CRA	California Redwood Association
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standards, U.S. Department of Commerce
CTI	Ceramic Tile Institute
CTI	Cooling Tower Institute
DHI	Door and Hardware Institute
FCC	Federal Communication Commission
FGMA	Flat Glass Marketing Association
FM	Factory Mutual
FS	Federal Specifications
HPMA	Hardwood Plywood Manufacturers Association
IAMPO	International Association of Plumbing and Mechanical Officials
ICEA	Insulated Cable Engineers Association
IEEE	Institute of Electrical & Electronic Engineers, Inc.
IES	Illuminating Engineering Society
IMI	International Masonry Institute
IRI	Industrial Risk Insurers
MIA	Marble Institute of America
MIA	Masonry Institute of America
MLSFA	Metal Lath/Steel Framing Association
MS	Military Specifications
MSS	Manufacturers Standardization Society of the Valve & Fittings Industry.

NAAMM	National Association of Architectural Metal Manufacturers
NBFU	National Board of Fire Underwriters
NBS	National Bureau of Standards
NCMA	National Concrete Masonry Association
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NESC	National Electrical Safety Code
NFPA	National Fire Protection Association
NFPA	National Forest Products Association
NOFMA	National Oak Flooring Manufacturers Association
NPCA	National Paint and Coatings Association
NSF	National Sanitation Foundation
NTMA	National Terrazzo & Mosaic Association
NWMA	National Woodwork Manufacturers Association
OSA	Office of the State Architect
PCA	Portland Cement Association
PCI	Pre-stressed Concrete Institute
PDCA	Painting and Decorating Contractors of America
PDI	Plumbing and Drainage Institute
PEI	Porcelain Enamel Institute
PS	Product Standard, U.S. Department of Commerce
RCSB	Red Cedar Shingle and Hand split Shake Bureau
RIS	Redwood Inspection Service
RFCI	Resilient Floor Covering Institute
SCMA	Southern Cypress Manufacturers Association
SDI	Steel Deck Institute
SDI	Steel Door Institute
SFPA	Southern Forest Products Association
SIGMA	Sealed Insulating Glass Manufacturers Association
SJI	Steel Joist Institute
SMACNA	Sheet Metal and Air Conditioning Contractor National Association
SPIB	Southern Pine Inspection Bureau
SPR	Simplified Practice Recommendations, U.S.
SSPC	Steel Structure Painting Council
SWI	Steel Window Institute
TCA	Tile Council of America
UBC	Uniform Building Code
UCI	Uniform Construction Index
UL	Underwriters' Laboratories, Inc.
UMC	Uniform Mechanical Code
UPC	Uniform Plumbing Code
WCLIB	West Coast Lumber Inspection Bureau
WIC	Woodwork Institute of California
WWPA	Western Wood Products Association

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. General requirements for reference standards pertaining to the Work and is supplementary to all other regulatory requirements mentioned or referenced elsewhere in the Contract Documents.

1.02 REFERENCE AND STANDARD TYPE SPECIFICATIONS:

Specifying by reference to a reference and standard type specification document or to another portion of the Contract Documents shall be the same as if the referenced document or portion of the Contract Documents referred to were exactly repeated at the place where such reference is made. In case of a conflict between the requirements of regulatory agencies and the referenced and standard type specification documents, Contractor shall conform to the most restrictive requirement if such conformance is legal.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 DESCRIPTION

A. All inspection and testing required to establish compliance with Contract Documents and Title 24 CCR requirements, except as may be otherwise specified, shall be made by an independent professional testing agency or firm selected and paid by the Owner/District (or as otherwise noted). All work prior to the call out of the inspection services shall be approved by the Inspector of Record as ready for the inspection services.

B. The cost of most services for testing and inspection in compliance with Contract Documents requirements will be paid by the Owner. If initial tests indicate non-compliance with Contract Document requirements, any non-compliance testing shall be performed by the same inspection service and back charged to the General Contractor. Schedule portions of the work requiring testing and inspection services so that the time of the agency on the work is as continuous and brief as possible. Should an inspection service be called out without proper pre-inspection and approval by the Inspector of Record, and the Contractor causes the inspection service to be on site for longer than the minimum call-out costs, or the Contractor causes the inspection service to make a return call to the site for the same inspection, the additional costs shall be back-charged to the Contractor.

C. Concrete Coring Procedures: Prior to the start of any concrete coring, the Contractor shall submit a detailed coring plan, indicating the size and precise locations of the cores, for approval by the Architectural Team/Structural Engineer. Proposed coring locations must be marked in the field and verified by the District IOR. The project Architectural Team/Structural Engineer may also request to perform a field inspection if deemed necessary. The Contractor SHALL arrange for and bear the costs of all Pachometer tests of the areas to be cored.

1.02 CONTRACTOR'S RESPONSIBILITY

A. Coordination: The Contractor shall initiate and coordinate testing and inspections required by the Contract Documents and public authorities having jurisdiction over the work through the Architect and/or Inspector of Record.

B. Access: Furnish free and safe access to the various parts of the work and assist testing and inspection personnel in the performance of their duties at no additional cost to the Owner.

C. Data: Furnish records, drawings, certificates, and similar data as may be required by the testing and inspection personnel to assure compliance with the Contract Documents.

D. Notification: Provide the Architect and/or Inspector of Record and Testing Laboratory with at least 72 hours advance notification of required testing.

E. Defective work: Remove and replace any work found defective or not complying with Contract Document requirements at no additional costs to the Owner (shall apply to 1, 2, and 3 immediately below). Where testing personnel take cores or cut-outs to verify compliance, repair prior to acceptance and as approved by the District IOR.
   1. Concrete: If test cylinders for concrete fail to meet design stresses, make core and load tests as may be directed by the Design Professional; make core tests in accordance with an ASTM C42 or most recent update and load tests in accordance with ACI 318 or most recent update. Correct all deficiencies found in forms, reinforcing steel and embedded items.
   2. Structural Steel: Should any weld or structural connection fail to meet design stresses, provide sonic or x-ray examination of all structural connections as directed by the Architect/engineer. Replace or repair all defective connections as directed.
   3. Roofing membrane work: Should roofing membrane, including associated flashing and jointing, indicate non-compliance with Contract Document requirements, provide corrective work as directed.

F. Lead Levels in Water: The domestic water piping system shall be protected during tie-ins or other construction activities that have the potential to elevate the lead levels in the water. The water in the domestic water piping shall be tested prior to the start of work and the lead levels documented. Testing shall also be performed upon the completion of all work and any lead contamination, above the levels documented prior to the start of work shall be the Contractors responsibility to reduce the levels to the pre-project levels.
   1. If the domestic water system is contaminated as a result of construction activities, the Contractor shall decontaminate the domestic water system. The procedures shall comply with applicable regulatory requirements.

1.03 TESTING LABORATORY RESPONSIBILITY

A. Taking Specimens: Specimens and samples for testing, unless otherwise provided in the Contract Documents, will be taken by the testing personnel. Sampling equipment and personnel will be provided by the testing laboratory. Deliveries of specimens and samples of the testing laboratory will be performed by the testing laboratory.
   1. When the testing laboratory is ready to test, but is prevented from testing or taking specimens due to incompleteness of the work or other scheduling lapses, all extra charges for testing attributable to the delay may be back-charged to the Contractor and shall not be borne by the Owner.

B. Test Reports: Reports shall include all tests made, regardless of whether such tests indicate that material is satisfactory or unsatisfactory. Samples taken but not tested shall also be reported. Reports shall state which requirements with which the material or materials were sampled and tested. Test reports shall show the indicated or specified design strength(s) and state definitely whether or not the materials tested comply with the specification requirements.

Report distribution shall be made as follows:

Owner's Rep	1 copy, and 1 electronic pdf
Architect	1 copy, and 1 electronic pdf
Structural Engineer	1 copy
Contractor	2 copies
DSA	2 copies (or as req'd by DSA)

C. The inspection agency shall cooperate with the Contractor so as to cause no delay in the progress of the work, but shall be directly responsible to the Owner for his actions. The inspection agency shall have no authority to direct the work of the Contractor.

D. Submittals: Promptly submit copies of reports of inspections and tests, mill analysis, concrete mix designs and certifications per applicable sections of the specification.
   1. Comply with requirements of each technical specification section and DSA requirements.
   2. Reports shall include all tests made, regardless of whether such test indicate that the material is satisfactory or unsatisfactory. Samples taken but not tested shall also be reported. Records of special sampling operations as required shall also be reported. The reports shall show that the material or materials were samples and tested in accordance with the requirements of the Title 24 and with the approved specifications. Test reports shall show the specified design strength. They shall also state definitely whether or not the material or materials tested comply with requirements.
   3. Testing Agency is not authorized to:
      a. Release, revoke, alter, or enlarge on, requirements of Contract Documents.
      b. Perform any duties of the Contractor.

1.04 REQUIRED INSPECTIONS & TESTS

The following are inspection services and tests required of but not limited to the Inspection and Testing Agency.

A. Sitework inspections & tests: Perform the following services as required to assure compliance with requirements of Division 2 of the technical specifications.

Compaction & bearing: Test and verify bearing capacity of all load bearing earth, test compaction fills for compliance with required densities.

B. Concrete work inspections & tests: Perform the following services as required to assure compliance with requirements of Division 3 of the technical specifications.
   1. Cast-in-place concrete: Make slump tests for each batch delivered or at least 1 test per hour during continuous pours in accordance with requirements of ASTM C143/C143M-12; check and verify batch consistency. Inspect forms and verify sizes and conditions. Inspect reinforcing and verify its proper placement. Furnish continuous inspection during replacement, repair and patching operations, and curing of concrete. Make cure, and test at least 3 test cylinders of each strength, of concrete for each 50 cubic yards (38.23 m3) placed or for each day's pour, whichever is greater. Report exact mix tested, minimum size aggregate, location of pour in the work, cylinder identification, data of receipt of cylinder in laboratory, slump data, cement brand and type, admixtures used, dates and records offset cylinders, names of inspectors and laboratory personnel, and evaluation or analysis of cause, in case of test failure, and recommendations of remedial action.
   2. Cure specimens under laboratory conditions except when there is possibility of surrounding air temperature falling at project below 40F. In this case, additional specimens will be required to be cured under job conditions. For all test unless otherwise directed, break 1 cylinder at 7 days, 2 at 28 days.
   3. If 7 day tests appear to be marginal or fall below normal requirements, concrete shall be tested with an approved impact hammer. Should these readings verify low test cylinders, procedure of work beyond this point will be Contractor's responsibility until decision is reached as to removal of substandard concrete at each of 28 day period.

C. Metal work inspection & tests: Perform the following services as required to assure compliance with requirements of Division 5 of the technical specifications.
   1. Structural steel fabrication: Furnish visual inspection of all shop fabricated parts including joists and joist girders. This inspection may be done in shop or in field after delivery. Furnish inspection and testing of shop welds in accordance with requirements for welding specification hereinafter. Check shapes, sizes, classes, and types of steel. Verify conformance of structural steel materials with requirements of Contract Documents. Test end welded studs, replace studs damaged by test.
   2. Structural steel field inspection & tests: Check location and fit of all anchorage and inserts. Verify adjustments to fit inaccuracies. Furnish visual inspection of erection of all structural steel components of the work. Furnish inspection and testing of all field welding in accordance with requirements for welding in accordance with requirements for bolting specific hereinafter. Inspect and test all bolted connections in accordance with requirements for welding specified hereinafter. Inspect for compliance with AISC Code of Standard Practice with requirements of the Contract Documents; other duties and responsibilities as may be noted on drawing.

3. Welding requirements: Furnish visual inspection of all field fillet welding. Furnish inspection of fillet welds in accordance with requirements of AWS D1.1 (Rev. I): allow for inspection of a minimum of 15% of fillet welds by magnetic particle or dry penetrant methods
4. Bolting requirements: Furnish visual inspection of structural joints where ASTM A325-10e1 bolts are used; verify the applicable requirements of AISC specifications are met.

D. Thermal and moisture protection work testing & inspection: Perform services as required to assure compliance with requirements of Division 7 of the technical specification.

E. Roofing: Check deck surfaces prior to application of roofing materials and verify that substrate is in satisfactory conditions to receive roofing. Furnish continuous inspection during application of roofing, including application of vapor barriers, insulation and roofing. Inspect all sheet metal flashings, counterflashing and reglets for satisfactory and waterproof installation.

F. Wood: Check framing lumber moisture content prior to framing.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION - (NOT USED)

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES:
A. Tests and inspections.

1.02 RELATED SECTIONS:
A. Work to be tested or inspected: Respective Sections.

1.03 TESTS AND INSPECTIONS; GENERAL:
A. General:
1. See General Conditions and Supplementary General Conditions.
2. Inspection: Per Title 24, 108 & 1701.

B. Contractor: Shall furnish labor, materials, and equipment and perform all operations required to take and prepare test samples, and required to permit inspection of all work.

C. Contractor responsibility: Each contractor responsible for the construction of a main wind- or seismic-force-resisting system, designated seismic system or a wind- or seismic-resisting component listed in the statement of special inspections shall submit a written statement of responsibility to the building official and the owner prior to the commencement of work on the system or component. The contractor's statement of responsibility shall contain acknowledgment of awareness of the special requirements contained in the statement of special inspection, per Section 1704A.4, 2013 CBC.

D. Payment of Tests & Inspections Costs:
1. District: District will pay all costs for required testing and inspection of both on-site and off-site work; except where specifically noted otherwise.
2. Costs to be reimbursed to District by Contractor:
a. Cost of testing materials, which fail to meet requirements of Contract Documents.
b. Overtime Costs: Whenever Contractor elects to work during hours other than normal work week and laboratory inspection is required, District will pay normal cost of laboratory inspection and Contractor shall pay that portion of laboratory inspection cost due to "overtime".
c. Where specifically noted.

1.04 TESTING AGENCY:
A. All tests shall be made by a well-established, independent Testing Laboratory(s) selected by District and satisfactory to the Architect and the Division of the State Architect.

1.05 RESULTS:
A. Test Reports:
1. Testing Laboratory to report results of all tests in writing.

2. Reports shall state that:
   a. Tests were made under responsible charge of a Testing Engineer, licensed to practice Civil/Structural Engineering, State of California.
   b. Material(s) were tested per requirements of Contract Documents and Division of the State Architect.
   c. Material(s) PASSED or FAILED TO PASS requirements.
3. Report (s), Distribution:

Architect	1 hard copy;1 electronic pdf
Inspector	1 hard copy
Contractor	1 hard copy
District	1 electronic pdf
DSA	2 copies (or as req'd by DSA)

B. Certificate: Each time work on this project is suspended and upon completion of the work, the Testing Laboratory shall furnish a notarized certificate in duplicate to the Division of the State Architect stating:
1. Tests for the work were made per requirements of Contract Documents and Division of State Architect.
2. All such tests and reports made for the work were reported.
3. A list of all tests performed.

1.06 REQUIRED TESTS AND INSPECTIONS (CRC, 1998):

A. General: Tests and inspections are referenced to Specification Divisions and Sections.

B. Excavation, Foundations and Retaining Walls – CBC, Chapter 18A:
1. Inspection:
   a. Earth Fill.

C. Division 3, CONCRETE - CBC Chapter 19A:
1. General Requirements: Apply to all Division 3 work.
   a. Concrete "Design Mixes":
      1) By District designated Testing Laboratory, per Section 1903A and Section 1905A.1 through 1905A.1.21, Title 24, by Method B or C.
      2) District will pay cost of one direct-pour mix and/or one pump mix for each specified concrete strength in each aggregate type.
   b. Batch Plant Inspection: Continuous inspection by Testing Laboratory for all "structural concrete", per Title 24, Section1929A.4. The Contractor shall notify the Laboratory 24 hours in advance of the time concrete is to be mixed, and shall promptly notify the Laboratory of postponement or cancellation of mixing. The Contractor shall reimburse the District for costs incurred resulting from failure to give adequate notification of postponement or cancellation.

c. Cement:
    1) Testing: Where not accompanied by a D.S.A. acceptable manufacturer's mill analysis and test certificates, test per Section 1903A Title 24.
    2) Contractor to reimburse District for testing costs.
d. Concrete Consistency: Measure consistency by the "Standard Method of Test for Slump of Portland Cement Concrete", ASTM C143/C143M-12. The District Inspector shall make this test twice each day or partial day's run of the mixer.
e. Aggregate: Test in accordance with ASTM C33/C33M-13 and ASTM Method C227-12. Tests shall be less than one year old.
f. Concrete Test Cylinders: District's Inspector to make and cure per ACI 318.
g. Concrete Testing:
    1) Test per Section 1903A, Title 24.
    2) Make one test at 7 days, and one test at 28 days; except, do not make 28-day test when 7-day test meets final design strength.
    3) Where concrete does not meet design strength, take core samples; and test per ASTM C42/C42M-13 and as follows:
        a) The cores shall be taken at representative places throughout the structure as designated by the Structural Engineer and shall be at least 4" in diameter.
        b) In general, sufficient cores shall be taken so that knowledge will be had for all pours made. At least three cores shall be taken for each 4000 square feet of building. Not less than three cores shall be taken from each building.
        c) Where cores have been cut from the work, the Contractor shall fill the void with drypack and patch the finish to match the adjacent existing surfaces.
h. Inspection:
    1) General: Conform to Title 24, Section 1701A.
    2) Steel Reinforcement: By District's Inspector for proper size and location, prior to placing concrete.
    3) Concrete: Continuous inspection of all concrete placements by District's Inspector. Keep a "placing record" of pours per Title 24, Section 1913A.

2. Cast-In-Place Concrete:
    a. Test all structural concrete.
    b. Two (2) molded cylinders for testing for each truck load and for each grade of concrete. Not less than one test/day/each grade of concrete.
    c. Slump test each truck load of concrete delivered to the job site.

D. Division 3, STEEL REINFORCEMENT:
   1. Testing:
      a. Conform to Title 24, Section 1903A and 1913A.2.
      b. Test for conformity with ASTM A615/A615M-13.
      c. Tests:
         1) Where identifiable by manufacturer's heat number and mill analysis report: one tension and one bend test/each 10 tons or fraction thereof for #5 and larger bars.
         2) When not identifiable: one tension and one bend test/each 2 ½ tons, or fraction thereof, for all bar sizes.
   2. Inspection: See Paragraphs C and D above. Welding shall conform to Title 24.

E. Division 4, MASONRY – CBC Chapter 21A:
   1. Materials:

a.	Masonry Units	2103A
b.	Portland Cement	2103A.11.7
c.	Mortar and Grout Aggregates	2103A.9
d.	Reinforcing Bars	2103A.14, 1913A.2

   2. Quality:

a.	Portland Cement Tests	1903A
b.	Mortar and Grout Tests	2105A
c.	Masonry Core Tests	2105A.4
d.	Reinforcing Bars	

   3. Inspection:

a.	Reinforced Masonry	2105A
b.	Reinforcing Bar Welding Inspection	1913A.2, 1913A.7.4

F. Division 5, METALS:
   1. Testing; Structural Steel:
      a. General:
         1) Conform to Title 24, Section 2213A.
         2) Contractor to obtain manufacturer's certified mill analysis and test report for each heat.
         3) Identification: Conform to Title 24, Section 2203A.
         4) Testing Lab to verify steel identification, per ASTM A6, at fabricator's shop.
      b. Tests:
         1) Where not accompanied by acceptable identification, test material.
         2) Contractor to reimburse District for testing costs.
         3) Structural Steel; Title 24, Section 2213A.
   2. Field Testing; Wedge-Type Expansion Anchor Bolts:
      a. Conform to Title 24, and D.S.A. requirements. Inspector shall witness all tests.
      b. All tests to be made with suitable, properly calibrated devices.
      c. Tension test 50% of the anchor bolts for pull-out using twice the bolts allowable capacity.
      d. <u>If any bolt fails</u>, all adjacent bolts must be tested.
   3. Inspectors, General: All Inspectors shall be specially qualified and approved by DSA for the particular type of work they are inspecting.
   4. Inspection, Welding:
      a. Conform to Title 24, Section 2213A. Keep a systematic record of all welds.

b. AWS certified Welding Inspector from Testing Lab approved by DSA, shall inspect all shop and field welding for structural steel.
c. Welding Inspector shall check qualifications and ability of all welders to perform satisfactory work.
1) Inspector shall spend first fabrication day in shop observing specific techniques, welds, and welders to be used on the work.
d. Welding Inspector shall check and approve the type and capacity of all welding equipment, which shall conform to manufacturers' recommendations.

5. Testing, Welds: By Testing Lab.
a. Ultra Sonic Tests: Perform for all full penetration welds of 1/4" or greater.
b. Other Tests: As noted or required.

6. Inspection, Shop Fabrication: Conform to Title 24, Section 2213A by specially qualified Inspector from Testing Lab.

7. Certificates: Testing Lab and its Inspectors shall certify that all material, equipment, fabrication, installation, welding, procedures, and work observed and/or tested by them is satisfactory and conforms to requirements of Contract Documents and Division of State Architect; and that they have used all means necessary to determine quality of welds.

G. Wood - CBC, Chapter 23:

1. Materials:

a.	Lumber and Plywood Grading	2303
b.	Glue - Laminated Members	2303.1.3

2. Inspection:

a.	Glue-Laminated Fabrication	2303.1.3
b.	Timber Connectors	2304.9
c.	Manufactured Trusses	2303.4

H. Exterior Wall Coverings - CBC, Chapter 14:

1. Materials:
a. Portland Cement Plaster Chapter 25

2. Inspection:
a. Veneer Inspection Chapter

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The Contractor shall ensure that all employees, visitors, subcontractors, subcontractor employees, and suppliers, while on the worksite, comply with the requirements of OSHA, these requirements, and the safety precautions contained in the several Specification Sections.

B. The Contractor shall promptly and fully comply with and execute, without separate charge thereof to the District, shall enforce compliance with the provisions of the Williams Steiger Occupational Safety Health Act of 1970 (Public Law 91-596 with most recent updates and amendments) with particular attention paid, but not limited to, Title 29-Labor, Chapter XVII - Occupational Safety and Health Administration, Department of Labor Part 1926 - (Safety and Health Regulations for Construction), and part 1910 - (Occupational Safety and Health Standards), as printed, respectively, in the June 24, 1974, and June 27, 1974, Federal Register, and latest adopted amendments and changes thereto.

1.02 PRELIMINARY WORK

A. Prior to the start of and during the course of the work (above and below ground) the Contractor shall make a thorough survey of the entire worksite to determine all potential hazards. Workmen shall be made aware of those hazards and shall be instructed in procedures and the use of equipment for their protection. The Contractor shall verify the location and condition ("live" or "dead") of all utilities on and near the worksite and take precautions to protect his employees, subcontractors, material men, the general public, and the property.

1.03 IMMINENT DANGER

A. The District may stop those operations which create an imminent danger to employees (as defined by OSHA), to the public and to property.

B. The Contractor shall be wholly responsible for any accident (including death) occurring at any time during the progress of the work and until the final acceptance of the work by the District which may happen to any of his employees/workmen or those of any Subcontractor employed on the building, the property, or for any damage or injuries (including death) which his work and operations may cause to the work being constructed, or to existing buildings, or to any tenants and occupants of the property, or of the adjoining properties, or to the public, or to any public or private property.

1.04 COOPERATION:

A. The Contractor shall cooperate with the safety representatives of the District, District's Insurance Managers and the District's Insurance Company in any and all inquiries before, during, and after the project.

1.05 SAFETY RESPONSIBILITIES:

A. Contractor's Superintendent shall:
   1. Ensure compliance with these requirements, OSHA requirements and other safety requirements, and provide and implement an Injury and Illness Prevention Program (IIPP) at the project site.
   2. Provide, supervise, and support a Contractor's Project Safety Supervisor and enable him/her to execute effectively their duties and responsibilities.
   3. Authorize immediate action to correct substandard safety conditions.
   4. Review and act to ensure compliance with safety procedures with his supervisors, subcontractors and suppliers.
   5. Take an active part in all supervisory safety meetings.
   6. Cooperate with safety representatives of the District, District Insurance Managers, and the District's insurance company.
   7. Ensure that all security and temporary fencing has been secured to prevent any movement or causal action that could contribute to any hazardous or unsafe condition, or which ultimately may cause harm.

B. Contractor's Project Safety Supervisor shall:
   1. Make thorough daily safety inspections of the worksite and immediately act to eliminate unsafe acts and unsafe conditions, and record all suggestions make and corrective action taken.
   2. Investigate worksite accidents and recommend immediate corrective action.
   3. Weekly safety meetings shall be conducted and documented in the daily report of activity by the contractor. Weekly safety meeting notes shall be recorded, noting the contractors and trades on site, the topics that were discussed and the attendance by contractor name, workmen name and trade, in attendance on the project that day.
   4. Review safety meetings reports submitted by job foremen and act to ensure that meaningful weekly safety meetings are held by the job foremen.
   5. Attend foremen "tool box" safety meetings and evaluate effectiveness.
   6. Assist in the preparation of accident investigation and reporting procedures.
   7. Implement training programs for supervisors and employees as they apply to their specific responsibilities.

8. Be responsible for the control, availability, and use of safety equipment, including employee personal protective equipment.
9. Coordinate his activities with those of the District's Inspector and/or Project Manager, and immediately implement their safety suggestions.
10. Coordinate public relations aspects of the Contractor's safety program.

C. Contractor's Job Foreman shall:
1. Instruct workmen regarding safe work practices and work methods at the time workmen are given work assignments.
2. Furnish and enforce the use of personal protective equipment and suitable tools that are equipped with all the manufacturer's supplied safety features, and have not been altered in any way, for the job.
3. Continuously check to see that no unsafe practices and conditions are allowed to exist on this portion of the work.
4. Set a good example for his personnel.
5. Make a complete investigation of accidents to determine facts necessary to take corrective action to prevent a recurrence, and record the facts in a written report to accompany the daily report as set forth in the IIPP.
6. Promptly supply information for, or complete, an Accident Report and Investigation Form as directed by the Contractor Safety Supervisor and Contractor's Superintendent/Project Manager.
7. Hold weekly "tool box" safety meetings with his personnel to:
    a. Discuss observed unsafe work practices and unsafe conditions.
    b. Review the accident experience of his crew and discuss correction of the accident causes.
    c. Encourage safety suggestions from his crew and report those suggestions to the Safety Supervisor.
8. Ensure that first aid is promptly administered to an injured employee.
9. Report immediately, to Contractor's Superintendent/Project Manager, or Safety Supervisor, any injuries, or violations of job safety and security.

D. Subcontractor's Job Superintendent shall:
   1. Plan and execute his work so as to comply with the Construction Safety Program.
   2. Furnish and enforce the use of personal protective equipment.
   3. Attend supervisory personnel safety meetings schedule by the Contractor.
   4. Schedule and attend weekly "tool box" safety meetings to be held by job foremen for all employees.
   5. Report to the Contractor's Project Safety Supervisor or Contractor's Superintendent all observed unsafe conditions, unsafe practices, and violations of job security.
   6. Cooperate with the District's safety representative.

1.06 CONTRACTOR'S SAFETY SUPERVISOR:

A. Contractor shall designate a full-time employee as Contractor Project Safety Supervisor.

B. Qualifications must be approved by the District. Supervisor shall:
   1. Have heavy construction experience of not less than three (3) years, one of which must have been in a supervisory capacity.
   2. Be familiar with job safety laws and regulations.
   3. Have accident prevention experience.

C. Duties: Project Safety Supervisor shall conduct regular inspections of the work, shall ensure compliance with job safety requirements, shall maintain the Contractor's safety program IIPP on site and available for review by the District's Inspector and/or Project Manager and shall enforce safe practices, use of safety equipment and personal protective equipment, and other such activities as may be required by OSHA, the safety requirements, and the safety precautions contained in the several Specification Sections.

D. If the Project Safety Supervisor is not effective in executing the duties assigned him, the District may request, in writing, that the Contractor furnish a new Project Safety Supervisor.

E. If the Contractor desires to replace the Project Safety Supervisor, he shall so notify the District and the District's Insurance Managers, in writing and shall submit the name, experience and qualifications of the proposed Project Safety Supervisor for approval.

1.07 REQUEST FOR VARIANCES

A. Request for variances to deviate from OSHA requirements must follow the current established procedures by that Agency.

1.08 FAILURE TO COMPLY

A. If the Contractor fails to comply with the requirements of OSHA, the safety requirements, and the safety precautions contained in the Specifications Sections, or to provide an on-site IIPP, the District may modify or stop the work and portions thereof, until such failure is remedied. Willful and repeated failure to comply could result in the shutdown of the work, and portions thereof. No part of the time lost due to any such modification of operations or stop orders shall be made the subject of a claim for extension of time or for increased costs of damage by the Contractor.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION - (NOT USED)

END OF SECTION

PART 1 - GENERAL

The District will provide a Project Inspector, or Inspector of Record (IOR) for this project.

Contractor shall submit an Inspection Request Form to the Project Inspector (IOR) at least 48 hours prior to the time the inspection is needed, and on the form required. Contractor shall not cover any work requiring inspection until the Project Inspector (IOR) has inspected and approved the subject work.

For work not in conformance with the Contract Documents, the Project Inspector (IOR) shall submit to the Contractor a Deviation/Nonconforming Notice.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Temporary utilities, construction trailers/facilities and project sign(s) which are to be provided and maintained by the Contractor.

B. Dust and noise control.

C. General temporary items including staging area for material delivery and safety and security lighting.

1.02 TEMPORARY UTILITIES:

A. Water:

1. Arrange for water with District Construction/Project Manager and install all necessary water lines, connections and metering devices for project, and upon completion of the work, remove such temporary facilities.
2. District will pay for all water needed for construction. Water conservation techniques are to be observed by all workmen. Contractor is to provide and maintain all water conveyance equipment, hoses, nozzles, hose bib connections, free from leaks, and equip all hoses with positive closing, hand-squeeze-type operating nozzles - - it is not permitted to operate a hose without a positive closing nozzle.
3. Provide suitable drainage system, subject to the approval of the Architect/Engineer and as indicated on the approved SWPPP, to carry construction waste water from site to an approved disposal location.

B. Electricity:

1. District will pay for all electricity needed for construction. Contractor is to arrange for and install all necessary temporary poles, wiring and metering devices and, upon completion of the work, remove such temporary facilities. Electricity conservation best management practices shall be observed by all workmen, and any unnecessary lighting, or electrical discharge shall be turned off at the end of each shift. Only safety lighting is allowed after each shift is concluded.
2. Furnish and install area distribution boxes, so located that the individual trades may use 100 foot maximum length extension cords to obtain adequate power and work task lighting, at points where required for the work, for inspection and for safety.
3. Provide all electricity needed for construction including connections for construction equipment requiring power.
4. Lighting in the construction work area shall be sufficient to allow safe travel for workmen and the Architectural team during normal working hours of the project, and shall be shut down to conserve energy after normal construction working hours.

C. Natural Gas: The Contractor shall provide and install gas equipment and piping necessary to perform his work, and shall remove same upon completion of the work. The Contractor shall pay for the Natural gas used in the work.

D. Telephone/Communications/Data:
   1. Make necessary arrangements and pay costs for installation and operation of telephone, communication, or data service to the Contractor's office at the site.

E. Use all means necessary to maintain temporary facilities and controls in proper and safe condition throughout progress of the work.

F. Make required connections to existing utility systems with minimum disruption to services in the existing utility systems. When disruption of the existing service is required, do not proceed without the Architect and/or Inspector's approval with at least 72 hours written request and approval. When required, provide alternate temporary service, should it be necessary as deemed by the Architect and/or Inspector, or Project Manager.

1.03 CONTRACTOR'S FACILITIES:

Contractor shall provide temporary offices, storage sheds, fencing, barricades, signage, hoists, scaffolds, railings and other facilities as required and specified. Installation and maintenance of such items shall be the responsibility of the Contractor.

A. Temporary Offices for Contractor, the District Project Manager and District Inspector of Record.
   1. The contractor shall provide and maintain two trailers on the site for the duration of the project, up to and including the date the Certificate of Occupancy will be filed by the District with the Board of Education.
   2. One trailer shall be for the use of the general contractor, and the other trailer shall be for the use of both the District Project Manager, and the District IOR.
   3. Both trailers shall have ample headroom; shall be properly lighted, heated and ventilated, and supplied with air conditioning sufficient to properly heat and cool the trailer between 68 and 76 degrees Fahrenheit on any day during construction.
   4. The trailer for the District Project Manager, and the District IOR shall have a minimum of two separate entrances with an office space for each separated by an interior wall and lockable door, and each space shall be provided with a telephone line, fax line, and high speed internet service, with a new or refurbished office desk at least 30" x 60" in size, with drawers that operate, with a drawer for miscellaneous office supplies, a drawer to accommodate 8 1/2 x 11 size file folders, one drawer to accommodate bulk office supplies, one new or refurbished office chair with casters, one new or refurbished side chairs with casters, a worktable or drawing table in sufficient size to lay out a full size set of project drawings, and one shelf at least 12" deep by 48" in length and secured for safely storing project specifications, project binders, and code books..
   5. The Contractor shall provide temporary toilet facilities and wash sinks within close proximity (no more than 30 feet) to the trailer for the District Project Manager, and the District IOR, which facilities shall be maintained as recommended by the supplier and common industry standards.

6. The trailers, equipment and the furniture shall remain the Contractor's property. Contractor shall remove such property upon completion of the work and the filing of the Certificate of Occupancy by the District.

B. Sanitary Facilities:
   1. The Contractor shall provide temporary toilet facilities which may consist of portable chemical toilets, and hand washing equipment. Number of toilets shall be based on number of workers with a minimum of 1 toilet facility per 10 workers. Placement of temporary toilet facilities shall be agreed upon at the site with the District Construction/Project Manager.
   2. Toilet facilities shall be kept supplied with toilet paper, and kept in a clean and sanitary condition until completion of the work, and then be removed from the work site. Upon removal, that portion of the site shall be properly cleaned and graded/repaired.

C. Contractor's Security Barricade:
   1. The Contractor shall erect the temporary security barricades for the purpose of defining construction lay-down areas, staging area and work zones. Temporary security barricades shall be provided on school site at exterior locations, and at building interiors, as necessary to provide a clear, obvious separation between school users and construction personnel. New or used material may be used.
   2. Unless otherwise indicated or specified, barricade shall be constructed of 6'-0" high chain link fence material with T-post condition at bottom for stability, shall have top rails, and 6 gauge minimum wire support at the bottom, BLACK screen material securely attached to the chain link material. Space posts not to exceed 10 feet on centers. Posts shall be of the following nominal pipe dimensions: terminal, corner, and gate posts 2-1/2", line posts 2", with diagonal supports at each corner. Chain link fabric shall be not less than 13 gauge, 2" mesh, and in one width. Posts, fabric and accessories shall be galvanized. Some fencing may require terminal posts to be sunk in the ground, or with appropriately placed concrete footings, and/or may require sandbags for ballast, as determined by the Inspector and/or Project Manager.
   3. Chain link fencing shall be free from barbs, icicles or other projections resulting from the galvanizing process, and shall be knuckle-knuckle. Fence fabric having such defects will be rejected even though it has been erected.

4. Gates shall be fabricated of steel pipe with welded corners, and horizontal and diagonal bracing as required to prevent flexing. Fabric to be attached to the frame at 12 inch centers. Provide all gate hardware of a strength and quality to perform satisfactorily until the barricade is removed upon completion of the work. Provide locks sufficient to secure the area, and that can be opened with one hand (e.g. combination locks).
5. At the completion of the work, remove barricade and concrete post footings from the site; backfill and compact fence footing holes by patching with like materials. Existing surface paving that is cut into or removed shall be patched and sealed to match the surrounding areas with like materials, and in the same finishes.
6. Contractor shall maintain all fencing and gates in good order on a daily basis, including the masking of graffiti as deemed necessary by the Inspector, and/or Project Manager, and shall secure the project fencing and gates at the end of every work day.

D. Other Enclosures:
1. Provide temporary weather-tight enclosures at openings in exterior walls to create acceptable working conditions, and/or to allow for temporary heating and for necessary security.
2. Provide protective barriers that shall be at least 4' in height, and extend to protect all areas at tree drip lines, around plants and other improvements designated to remain, as determined by the Inspector and/or Project Manager and related specification sections.

E. Storage Yards and Storage Containers:
1. The Contractor shall fence and maintain storage yards in an orderly manner.
2. Provide steel storage containers, lockable, free from graffiti, and in good condition for materials and equipment that cannot be stored offsite or in a bonded and agreed-upon warehouse.
3. Exact location, size and access of storage yards and steel storage containers shall be approved by the District Construction/Project Manager.
4. Remove storage yards and containers as rapidly as progress of the work will permit.

1.04 REQUIRED SIGNS AT GATES

A. Contractor shall post at the work site signs not greater than twenty-five feet (25') apart at all gates stating "Authorized Personnel Only – Construction Area" and "No Parking – Fire Lane," as determined by the contract specifications and drawings, and/or as designated by the Inspector and/or Project Manager

1.05 HARD HAT SIGN

A. Contractor shall post a sign at each gate and/or entry to any area of construction, identifying the job site as a "hard hat area". No person without a hard hat shall be allowed in the sections of the project under construction. This shall be the responsibility of the Contractor's Project Safety Inspector to enforce.

1.06 DUST AND NOISE CONTROL

A. Throughout the entire construction period, Contractor shall maintain dust control by use of water or other environmental controls as may be approved by the Architect, Inspector, and/or Project Manager.

B. Noise Control: Muffle all equipment to a maximum of 85 Dba at 5' from equipment. Noise control is to be kept to a minimum to perform the operations of construction. NO Radios or projected sound will be allowed on the job site.

1.07 GENERAL ITEMS

A. Staging areas for delivery of materials and equipment will be at locations designated by the drawings and specifications, and/or as approved by the Architect, Inspector, and/or Project Manager.

B. Safety and Security Lighting: Provide 5 foot candles outside.

C. Noise Control: Muffle all equipment to a maximum of 85 Dba at 5' from equipment.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Assembly and submission of operating and maintenance data and manuals.

B. Submission of preliminary draft of final data and manuals.

C. Instruction of Owner's personnel in operation, adjustment and maintenance of products, equipment and systems.

1.02 MANUALS

A. General: Where manuals are required to be submitted covering items included in this Work prepare all such manuals in durable plastic 3-ring binders no less than 8-1/2 by 11 inches in size and with at least the following:
   1. Identification on, or readable through, the front cover stating general nature of the manual;
   2. Neatly typewritten index near the front of the manual, furnishing immediate information as to location in the manual of all data;
   3. Copy of all guarantees and warrantees issued.

B. Maintenance and operation instructions:
   1. Procure or prepare and include in manuals, operating and/or maintenance instruction for all equipment and/or materials that will require any adjustment, servicing, or attention for its proper operation or use.
   2. These instructions shall set forth all of the information necessary for the District to operate and make full and efficient use and perform such maintenance and servicing, as would ordinarily be done by the District or maintenance personnel.
   3. Write instructions in simple, non-technical language when possible, with sufficient diagrams and explanation where necessary to be readily understandable by average layman. Possible hazards shall be particularly pointed out with instruction cautioning against mistakes that might result in damage or danger to equipment, building, or personnel.

C. Extraneous data: Where contents of manuals include manufacturer's catalog pages, clearly indicate the precise items included in this installation and delete or otherwise clearly indicate all manufacturer's data with which this installation is not concerned.

1.03 MANUAL CONTENT

A. Neatly typewritten table of contents for each volume, arrange in systematic order.

B. List:
   1. Contractor, name of responsible principal, address, telephone number, and email address of the company contact.
   2. Each product including name, telephone number, and email address of:
      a. Subcontractor or installer.

b. Recommended maintenance contractor.
c. Local source for replacement parts (within 50 mile radius of site).

3. Product name and other identifying symbols set forth in Contract Documents.
4. Product Data:
   a. Include only those sheets which are pertinent to specific product.
   b. Annotate each sheet to:
      1) Clearly identify specific product or part installed.
      2) Clearly identify data applicable to installation.
      3) Delete references to inapplicable data.
5. Drawings:
   a. Supplement product data with drawings where necessary to clearly illustrate:
      1) Relations of component parts.
      2) Control and flow diagrams.
   b. Do not use "Project Record Documents" as maintenance drawings.
6. Written Test:
   a. Provide where necessary to supplement Product Data and drawings.
   b. Organize in consistent format under separate headings for different procedures.
   c. Provide logical sequence of instruction for each procedure.
7. Warranties, Bonds, and Maintenance Contracts:
   a. Provide copies of each of the following:
      1) Proper procedures in event of failure.
      2) Instances which might affect validity of warranties, bonds, or contracts.

1.04 MANUAL FOR ARCHITECTURAL MATERIALS AND FINISHES

A. Include the following manufacturer's data:
   1. Catalog number, size, composition.
   2. Color and texture designations.
   3. Required reordering information.
   4. Recommend cleaning materials and methods.
   5. Cautions against detrimental cleaning materials and methods.
   6. Recommend cleaning and maintenance schedule.

B. Submit specified information for the following:
   1. Irrigation System: Section 328000.
   2. Landscaping: Division 32.
   3. Fire Extinguishers: Section 104416.13.

1.05 MANUAL FOR ROOFING MATERIALS

A. Include the following manufacturer's data:
   1. Instructions for inspection, maintenance and repair.

1.06 MANUAL FOR MECHANICAL EQUIPMENT AND SYSTEMS

A. Include the following manufacturer's data:
   1. Function, normal operating characteristics, and limiting conditions.
   2. Performance curves, engineering data, and tests.

3. Complete nomenclature and commercial number of replaceable parts.

B. Operating procedures including:
   1. Start-up, break-in routine, and normal operating instructions.
   2. Regulations, control, stopping, shut-down, and emergency instructions.
   3. Summer and winder operating instructions.
   4. Special operating instructions.

C. Maintenance procedures including:
   1. Routing operations.
   2. Trouble shooting guide
   3. Disassembly, repair, and reassemble.
   4. Alignment, adjusting, and checking.
   5. Servicing and lubricating schedule, including recommended lubricants.

D. Manufacturer's printed operating and maintenance instructions.

E. Control system operation sequences.

F. Parts list, illustrations, assembly drawings, and diagrams necessary for maintenance including:
   1. Life expectancy of parts subject to wear.
   2. Items recommended to be stocked as spare parts.

G. As-installed control systems diagrams.

H. Color-code legend, if any.

I. Valve tag number chart, with location and function of each valve, in typewritten format, clearly indicating location on a room, area, or building diagram in sufficient size to readily identify the item.

J. Submit specified information for the following; Mechanical equipment specified in the Mechanical Equipment schedules and Specifications.

1.07 MANUAL FOR ELECTRICAL EQUIPMENT AND SYSTEMS

A. Include the following manufacturer's data:
   1. Description of unit and component parts including:
      a. Function, normal operating characteristics and limiting conditions.
      b. Performance curve, engineering data and tests.
      c. Complete nomenclature and commercial number of replaceable parts.
   2. Panel board circuit directories indicating:
      a. Electrical service.
      b. Controls.
      c. Communications, if any.
   3. As-installed wiring color-code legend, if any.
   4. Operating procedures including:
      a. Routine and normal operating instructions.
      b. Sequences required.

c. Special operating instructions.

5. Maintenance procedures, including:
   a. Routine operations.
   b. Trouble-shooting guide.
   c. Disassembly, repair, and reassembly.
   d. Adjustment and checking.
6. Manufacturer's printed operating and maintenance instructions.
7. Parts list, including current prices, and recommended spare parts to be maintained in storage.

B. Submit specified information for the following:
   1. Electrical equipment specified in Mechanical and Electrical Equipment Schedules and Specifications.

1.08 ADDITIONAL DATA

A. Prepare and include the following:
   1. Additional data when need becomes apparent during instruction of District's personnel.
   2. Additional data specified in other Sections of Specifications to be included.

1.09 SUBMITTAL SCHEDULE

A. Preliminary Draft:
   1. Submit two copies of the proposed format, approximately fifteen (15) days before substantial completion to the Architect and Inspector and/or Project Manager for review and comments.
   2. Architect and Inspector will review, and return one copy with any comments.

B. Final Submittal:
   1. Submit, in final form, one copy of complete data seven (7) days prior to final inspection. Copy will be returned with comments.
   2. Submit four (4) copies in approved final form prior to final inspection and acceptance, and occupancy.

1.10 INSTRUCTION OF OWNER'S PERSONNEL

A. Prior to Substantial Completion, instruct District's personnel in necessary operation, adjustment, and maintenance of products, equipment and systems. District's personnel will consist of on-site School site personnel laypersons; Facility and Support Operations maintenance technicians; other District personnel. Instruction sessions (minimum of two) will be at a time and date convenient and pre-approved by the District Project Manager.

B. Operating and Maintenance Manuals, as well as knowledgeable installer(s) shall conduct the instruction, which SHALL BE VIDEOTAPED by the contractor, to constitute basis of instruction.

C. Review manual contents with District's personnel in detail to explain all aspects of operations and maintenance, and conduct hands-on demonstrations where appropriate, and conduct a question and answer session before the end of the training session. Training sessions will be as long as necessary to satisfy the personnel in attendance.

D. A listing of all personnel receiving instructions, complete with a sign-in sheet indicating the printed name, and the signature of those attending, dates and times of instruction, and pertinent data regarding the training specific equipment or system, shall be delivered to the Architect/Engineer/Inspector and/or Project Manager upon completion of instruction session(s).

E. The District's designated Facility and Support Operations (FASO) Representative will be instructed as to the proper operations of all environmental equipment and fire and life safety, and security systems prior to Substantial Completion and Occupancy of a project phase or building, or building area. This instruction will be provided to the District's FASO and School Site personnel with the basic working knowledge of all equipment systems.

F. Contractor shall perform all testing, adjusting, etc., as outlined in the specifications and/or as recommended by the manufacturer.

G. All HVAC equipment shall be operated a minimum of two (2) weeks or no less than 80 hours, with District specified MERV 7 or higher rating pleated filters, prior to Substantial Completion approval.

PART 2 - PRODUCTS - NOT APPLICABLE

PART 3 - EXECUTION - NOT APPLICABLE

END OF SECTION

PART 1 - GENERAL

1.01 SUBMITTAL REQUIREMENTS:

A. Assemble Warranties, Bonds, and Service and Maintenance Contract, executed by each of the respective Manufacturers, Suppliers, and Subcontractors, and submit to the Architect/Engineer for review and approval before Final Payment will be approved and released.

B Number of original signed copies required: Three (3) each and one electronic pdf.

C. Table of Contents Neatly typed in orderly sequence.

D. Provide complete information for each item:
   1. Product or work Item.
   2. Firm, with name of principal, address and telephone number.
   3. Beginning date of Warranty, Bond, or Service and Maintenance Contract.
   4. Duration of Warranty, Bond of Service, and Maintenance Contract.
   5. Provide the following information for District/Owner's Personnel:
      a) Procedure in case of failure or malfunction.
      b) Instances which affect Warranty or Bond validity.
   6. Contractor, name of responsible principal, address, telephone number and email address.

1.02 SUBMITTAL FORM:

A. Punch sheets for standard 3-ring binder.

B. Size: 8-1/2 x 11 inches.

C. Fold larger sheets to fit into binder.

D. Cover: Identify each packet with typed or printed title 'WARRANTIES AND BONDS" 1st:
   1. Title of Project.
   2. Name of Contractor.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

A. Work Includes:

1. Remove designated items for relocation.
2. Remove items to clear path for installation and subsequent removal of Relocatable housing units.
3. Remove excavated soil spoils from site.
4. Cap existing irrigation devices at designated Relocatable housing locations.

B. Related Work:

1. Requirements in Addenda, Alternates, Conditions and Division 1 collectively apply to this work.

1.02 QUALITY ASSURANCE

A. Demolition shall be in compliance with Title 24 of the California Code of Regulations and conform to the California Building Code, 2013 edition.

B. Utilities disconnection, capping and re-installation shall be by workmen licensed to perform such work.

1.03 SUBMITTALS

A. Two (2) copies of permits and notices.

B. Upon completion of work in this Section, submit record documents recording the extent of active and abandoned underground utilities.

1.04 EXISTING CONDITIONS

A. Contractor shall contact the local underground service alert company for information on buried utilities and pipelines.

B. Conduct demolition to minimize interference with adjacent structures, trees and properties.

C. Provide, erect and maintain temporary barriers and security devices.

D. Conduct operations with minimum interference to public or private thoroughfares. Maintain egress and access at all times.

E. Traffic: Conduct site-clearing operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction.

F. Prior to demolition or heavy vehicular activity, examine structures adjacent to the designated demolition, including concrete walks and asphaltic concrete paving. Obtain District Inspector's confirmation by signature for the following:

1. Record on the Project Record Documents any pre-existing conditions that could later be construed as Contractor damage.

2. Document each recorded pre-existing condition with a supporting photograph.

G. Protection of Existing Utilities: Protect existing utilities, including irrigation system from damage.
   1. Contact the local underground service alert company and the District prior to any trenching for determining location of underground utilities/irrigation lines.
   2. Contact the District for repair instructions for damaged lines.
   3. REPAIR OF HIDDEN DAMAGED PRODUCTS, DISCOVERED BY THE DISTRICT, WILL BE CHARGED DIRECTLY TO THE CONTRACTOR.

H. Protection of Existing Improvements: Provide protection necessary to prevent damage to existing improvements not indicated to be demolished and/or removed.
   1. Protect improvements on adjoining properties and on Owner's property.
   2. Restore damaged improvements to their original condition, as acceptable to property owners.

I. Protection of Existing Trees and Vegetation: Protect existing trees and other vegetation indicated to remain in place against unnecessary cutting, breaking or skinning of roots, skinning or bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip, excess foot or vehicular traffic, or parking of vehicles within drip line. Provide temporary guards to protect trees and vegetation to be left standing.
   1. Water trees and other vegetation to remain within limits of Contract Work as required to maintain their health during course of construction operations.
   2. Replace damaged trees that are damaged by construction activities.

PART 2 - PRODUCTS
Not Used.

PART 3 - EXECUTION

3.01 PREPARATION

A. Verify that structures to be demolished are unoccupied and discontinued in use.

B. Prevent movement or settlement of adjacent structures. Provide bracing and shoring.

C. Protect existing landscaping materials, appurtenances and structures, which are noted to remain.

D. Notify School maintenance personnel and utility authorities to locate and flag underground lines. Disconnect, remove and cap designated utility lines within demolition areas. Obtain release from respective utility companies that utilities have been capped in a safe manner.

E. Mark location of disconnected utilities. Identify utilities and indicate capping locations on project record documents.

3.02 EXECUTION

A. Remove excavated soil/rocks in association with the installation of the asphaltic sidewalks and building bases. Dispose of rocks and excavated debris to off-site dump. Top soil shall be stockpiled or spread in accordance with District's wishes at each indicated site.

B. Asphaltic concrete paving shall be saw cut to a straight line on the demolition border, prior to paving demolition.

C. Cease operations and notify Architect immediately if adjacent structures appear to be endangered. Do not resume operations until corrective measures have been taken.

D. Remove and promptly dispose of contaminated, vermin infested or dangerous materials encountered.

E. Do not burn or bury materials on Site.

F. Keep work sprinkled to minimize dust. Provide hoses and water main or hydrant connections for this purpose.

3.03 SITE CLEARING

A. General: Remove shrubs, grass, and other vegetation, improvements, or obstructions, as required, to permit installation of new construction. Remove similar items elsewhere on site or premises as specifically indicated. Removal includes digging out and off-site disposal of stumps and roots. Removal of trees are not permitted, unless prior approval has been obtained from the Architect and District.

B. Removal of Improvements: Remove existing above-grade and below-grade improvements as indicated and as necessary to facilitate new construction. Saw cut existing paving at boundary of areas to be removed.

3.04 DISPOSAL OF WASTE MATERIALS

A. Burning on Owner's Property: Burning is not permitted on Owner's property.

B. Removal from Owner's Property: Remove waste materials and unsuitable or excess topsoil from Owner's property.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

Forms for all cast-in-place concrete indicated on the drawings and subsequent removal of forms, except those earth forms described in this Section.

1.02 RELATED SECTIONS

A. Section 31 00 00 - Earthwork.

B. Section 03 21 00 - Steel Reinforcement.

C. Section 03 30 00 - Cast-in-place concrete.

1.03 QUALITY ASSURANCE

A. Qualifications of workmen: All workmen shall be experienced mechanics. Provide one person who shall be present at all time during execution of this portion of the work who shall be thoroughly familiar with the type of material being installed, the referenced standards and the requirement of this work and shall direct all work performed under this Section.

B. Codes and Standards: In addition to complying with all pertinent codes and regulations, comply with all pertinent recommendations contained in "Recommended Practice for Concrete Form work," publication 347R-88 and SP-4 of the American concrete institute.

C. Where provisions of pertinent codes and standards conflict with the requirement of this Section, the more stringent provision shall govern.

1.04 PRODUCT HANDLING

A. Protection: Contractor is to protect all form work materials before, during and after installation.

B. Damaged Forms: In the event of damage or misalignment, immediately make all repairs and replacement necessary at no additional cost to the School District.

PART 2- PRODUCTS

2.01 MATERIALS

A. Form lumber: All form lumber shall be new except as allowed for re-use of forms in Part 3 - EXECUTION of this Specification, and all form lumber shall be one of the following, a combination thereof, or an equal approved in advance by the Structural Engineer and DSA Structural Safety Section.
   1. Plywood forms may be Plyform, Plyron, and bearing the label of the Douglas Fir Plywood Association.
   2. Form lumber may be fir, larch hemlock or approved equal, seasoned lumber surfaced four sides.
   3. Form sealers shall be liquid form oil.

B. Other form materials and/or forming systems may be used if approved by the School District, Architect, Structural Engineer, and the Division of the State Architect (DSA). A complete list of materials, manufacturers and methods of application are to be submitted to the Architect, in accordance with Section 01 33 00 - Submittals and 01 25 13 - Product Options and Substitutions.

2.02 TIES AND SPREADERS

A. Form ties shall be of proven types and shall be a type which does not leave an open hole through the concrete and which permits patching at every hole.

B. When forms are removed, all metal ties shall be removed and shall be flush with the concrete surface. No metal ties shall be exposed on the exterior of the walls.

C. Wire ties and wood spreaders may be used only if approved by the Division of the State Architect (DSA).

2.03 ALTERNATE FORMING SYSTEMS

Alternate forming systems may be used if approved by the Division of the State Architect (DSA).

2.04 OTHER MATERIALS

All other form materials, not specifically described herein, but required for proper completion of concrete formwork, shall be as selected by the contractor subject to approval by the Division of the State Architect (DSA).

PART 3- EXECUTION

3.01 INSPECTION

A. Contractor shall verify and be responsible for all existing dimensions and elevations before any work is done.

B. Inspect the installed work of all other trades; verify that all such work is complete and that the installation of Formwork may begin.

C. Verify that forms have been constructed in accordance with all pertinent codes and regulations, referenced standards and the design.

D. Discrepancies: Do not proceed with installation in areas of discrepancy. Notify the Architect of all discrepancies. All discrepancies are to be fully resolved before proceeding with installation.

3.02 CONSTRUCTION FORMS

A. Forms are to be constructed sufficiently tight to prevent leakage of concrete, and able to withstand excessive deflection when filled with wet concrete. Forms shall be braced, anchored and properly aligned.

B. Layout and form all required cast-in-place concrete to the required dimensions indicated on the drawings.

C. Care shall be exercised in the layout of forms to avoid the necessity for cutting, patching or repair of concrete after it is in place.

D. Make provisions for all openings, offsets, recesses, anchorage, blocking and other requirements of the work.

E. Perform all forming required for work of other trades and do all cutting and repairing of forms required to permit such installations.

F. Carefully examine the drawing and specifications and verify with other trades for openings, reglets, chases, and other items that are required in the forms.

G. Forms for precast concrete shall be constructed to provide for shrinkage of the concrete, and shall be adequately braced. All edges shall have chamfer strips except as noted on drawings.

H. Construct all forms true, plumb, and square within a tolerance of 1/8" in 12 feet.

3.03 EMBEDDED ITEMS

Provide, install and check all required steel frames, angles, grilles bolts, inserts and other such items required to be anchored in the forms before the concrete is placed.

3.04 BRACING

A. Properly brace and tie the forms together so as to maintain size, shape, and alignment, and to provide safety to personnel.

B. Construct all bracing and supporting members of ample size and strength to safely support, without excessive deflection, all dead and live loads to which they may be subjected.

3.05 PLYWOOD FORMS

. Plywood forms shall be designed for loads imposed. Nail the plywood panels directly to studs and apply in a manner to minimize the number of joints.

B. Make all panel joints tight butt joints with all edges true and square, if necessary, use tape to prevent excessive leakage.

3.06 FOOTING FORMS

A. Foundation forms are to be wood unless otherwise approved by the Division of the State Architect (DSA).

B. Earth forms may be used for footings provided the soil will stand without caving and sides of the bank are made with a neat cut to the minimum dimensions indicated plus 2" wider than called for on the drawings. Comply with DSA mandatory minimum formwork requirements.

3.07 REUSE OF FORMS

A. Reuse of forms shall be subject to approval of the DSA Field Inspector.

B. Reuse of forms shall not delay of change the schedule for placement of concrete from the schedule if all forms were new.

C. Reuse of forms shall not affect the structural stability of the forms nor the appearance of the finished concrete.

3.08 REMOVAL OF FORMS

A. Side forms of foundations may be removed 48 hours after placement of concrete. Where foundations are supporting lateral loads, forms shall not be removed until approved by the DSA Field Inspector.

B. Use care and diligence, and protect workmen, passers-by, and the installed work and materials of other trades. Forms shall not be removed until the concrete can support all loads.

C. Cut nails, tie wires and form ties off flush, leave all surfaces smooth and clean.

D. Remove metal spreader ties and fill in the resulting pockets to match the surrounding areas with grout or dry pack. Sack all exposed faces.

E. Fill all holes resulting from the use of bolts, ties, spreaders and sleeve nuts with cement grout applied under pressure by means of a grouting gun; grout shall be one part portland cement, to two parts sand; apply grout immediately after removing forms.

3.09 CLEANING

A. Remove all forming material from the site and dispose of in approved dumps.

B. Clean area of all left over debris including stakes, ties, form boards, wires, concrete spills, etc. Leave area in a neat clean condition.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

A. Principal Work Items Are:
   1. Rebar.

B. Related Work:
   1. Cast-In-Place Concrete, Section 03 30 00.

1.02 REFERENCES

A. Requirement in Addenda, Conditions and Division 1 collectively apply to this work.

B. ASTM A82/A82M-07 - Cold Drawn Steel Wire for Concrete Reinforcement.

C. ASTM A615/A615M-09b - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement and ASTM A706 Grade 60 for all reinforcing bars to be welded.

D. CRSI - Concrete Reinforcing Steel Institute Manual of Standard Practice.

E. CRSI 63 - Recommended Practice for Placing Reinforcing Bars.

F. CRSI 65 - Recommended Practice for Placing Bar Supports, Specifications and Nomenclature.

1.03 SUBSTITUTIONS

Only written approval of Architect, by addenda or change order, will permit substitutions for materials specified. Refer to Sections 01 25 13 - Product Options and Substitutions procedures.

1.04 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies:
   1. Codes: Conform to Title 24, CCR and CBC, 2013 Edition.
   2. Off-site Work: Conform to local governing agency requirements.

B. Source Quality Control: Refer to Section 01400, Quality Control and Testing Services for analyses and tests required.

C. Perform concrete reinforcement work in accordance with CRSI, CRSI 63, and CRSI 65.

1.05 SUBMITTALS

A. Submit reports for analyses and tests per Section 01 45 00.

B. Submit mill certificates of supplied concrete reinforcing, indicating physical and chemical analysis.

C. Certificate For Off-site Work: Provide for off-site work, per Section 01 77 00, Project Closeout.

D. Submit shop drawings per Section 01 33 00. Indicate sizes, locations and quantities of reinforcing steel, bending and cutting schedules, splicing, stirrup spacing, supporting and spacing devices.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver reinforcement to Site in bundles marked with metal tags indicating bar size, length, configuration and building location.

B. Handle and store materials to prevent injury or unwanted bends.

C. Store materials on blocking to prevent contact with ground. Do not store materials in water puddles.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General: Conform to applicable Codes; refer to Title 24, Section 1908A in particular.

B. Rebar: CBC, 2013 Edition, Section 1907A which is based on ASTM A615/615M-13; deformed; grade 60 typical, other stresses where noted.

C. Welded Wire Mesh: Refer to ASTM A185-79; 75,000 psi tensile strength for 10 gauge and larger wire, 70,000 psi tensile strength for 11 gauge and smaller wire. Flat sheets only.

D. Tie Wire: Refer to ASTM A82-79; annealed steel, 16 gauge minimum.

2.02 FABRICATION OF REBAR

A. General: Per CRSI Standards.

B. Fabricate to lengths and shapes required.

1. Bends: Bend cold around a pin; minimum diameter shall conform to Title 24, Section 1907A.2.
2. Do not bend or straighten bars in a manner which will injure material.
3. Do not re-bend bars.
4. Bending of reinforcement shall comply with ACI310, Section 7.1 through 7.4.

C. Locate reinforcing splices, not indicated on Drawings, at points of minimum stress. Indicate locations on shop drawings.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install dowels in concrete, to match locations of masonry wall reinforcement.

B. Do not use rebar which has bends or kinks other than those required.

C. Do not heat, bend, cut, or alter rebar at Site without concurrence of Architect.

D. Place, support, and secure reinforcement against displacement. Do not deviate from alignment or measurement.

E. Spacing: Maintain following minimum clear distances between bars, or greater distances where required.
   1. All Cases: 1-1/2" minimum.
   2. Parallel Bars (except at splices): 1-1/2 times nominal diameter.

F. Clearances: Maintain following minimum clear distances to provide concrete coverage for protection of rebar, or greater distances where required.
   1. Footing surfaces poured directly on earth: 3".
   2. Walls against earth, but place in forms: 2".
   3. Other formed walls: 1-1/2".
   4. Columns: 2".
   5. Per CBC Section 1907A.6.
   6. Walls formed 3/4" from CMU walls.

G. Splices:
   1. Splice only at approved locations.
   2. Lap Splices: Wire tie securely together.
      a. Use typically for splices, corners, intersections.
      b. Minimum lap distance, unless otherwise required:
         1) Concrete: 40 bar diameters, but not less than 24".
   3. Other Splice Methods: Only with specific Architect approval.
   4. Separate splices: Code required distances.

3.02 FIELD QUALITY CONTROL

Inspection: Refer to Section 01 45 00, Quality Control and Testing Services.

3.03 ADJUSTMENT AND CLEANING

Prior to concrete placement, clean reinforcement coatings, rust, scale, that will reduce or destroy bond. Reinforcement appreciably reduced in section by cleaning shall be replaced as directed by Architect. Reposition misaligned reinforcement.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

A. Work Included:
   1. Cast-in-place concrete for the following:
      a. Curbs and footings
      b. Equipment pads
   2. Formwork.
   3. Curing and protection.
   4. Finishing.

B. Related Work:
   1. Requirements in Addenda, Conditions and Division 1 collectively apply to this work.
   2. Earthwork: Section 31 00 00.
   3. Asphaltic Concrete Paving: Section 32 12 16.
   4. Concrete Formwork: Section 03 11 00.
   5. Steel Reinforcement: Section 03 21 00.

1.02 SUBSTITUTIONS

Only written approval of Architect, by Addenda or Construction Change Document, will permit substitutions for materials specified. Refer to Section 01 25 13 - Product Options and Substitutions for procedure.

1.03 REFERENCES

A. ASTM C33/C33M-13 - Concrete Aggregates.

B. ASTM C94/C94M-13a - Ready-Mixed Concrete.

C. ASTM C150/CM150-12 - Portland Cement.

D. ASTM C260/C260M-10a - Air-Entraining Admixtures for Concrete.

E. ASTM C494/C494M-13 - Chemical Admixtures for Concrete.

1.04 QUALITY ASSURANCE

A. Design Criteria for Formwork:
   1. Contractor shall be solely responsible for formwork and shall:
      a. Design, construct and maintain formwork to safely support loads.
      b. Obtain governing agency approval.

B. Testing Agency:
   1. On-Site Work: District designated Testing Laboratory.
   2. Off-Site Work: Governing agency approved Testing Laboratory.

C. Requirements of Regulatory Agencies:
   1. Codes: Conform to Title 24 of the CCR and conform to CBC, 2013 Edition.
   2. Off-Site Work:
      a. Conform to local governing agency requirements.
      b. Obtain and pay for permits, licenses and fees.
      c. Arrange for tests and inspections.

D. Tests and Inspections: See Section 01 45 00, Quality Control and Testing Services.

E. Allowable Tolerances for Concrete Surface Smoothness: 1/8" maximum permissible variation from a true plane measured from a 10' straight edge placed anywhere on the surface.

F. Source Quality Control:
   1. Testing Laboratory shall provide continuous inspection at concrete batch plant for structural concrete, defined as follows: Footings, foundation walls, floor slabs-on-grade, and exterior reinforced slabs.
   2. Furnish Weighmaster's Certificates for all concrete.

1.05 SUBMITTALS

A. Concrete Design Mix: Reviewed by Testing Laboratory.
   1. Per ACI 318, Section 5.2 and 5.3.

B. Test Reports: Source and Field Quality Control tests.

C. Certificates:
   1. Weighmaster's Certificates: Per DSA requirements.
   2. Certificate for Off-Site Work: Provide for off-site work, per Section 01 77 00, Project Closeout.

D. Provide product data for specified products, under provisions of Section 01 33 00.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Storage:
   1. Cement: Store in weather-tight enclosures and protect against dampness, contamination and warehouse set.
   2. Aggregates:
      a. Stockpile to prevent excessive segregation or contamination with other materials or other sizes of aggregates.
      b. Use only one supply source for each aggregate stockpile.
   3. Admixtures:
      a. Store to prevent contamination, evaporation or damage.
      b. Protect liquid admixtures from freezing or harmful temperature ranges.
      c. Agitate emulsions prior to use.

B. Deliver Ready-Mixed Concrete in conformance with Title 24, Section 1905A.8 (which refers to ACI 318 Section 5.8).

C. Formwork Materials:
   1. On delivery to Site, place materials in area protected from weather.
   2. Store materials above ground on framework or blocking and cover with protective waterproof covering providing for adequate air circulation or ventilation.
   3. Handle materials to prevent damage.

1.07 JOB CONDITIONS

A. Environmental Requirements:
   1. Allowable Concrete Temperatures:
      a. Cold Weather: When depositing concrete in freezing or near-freezing weather, concrete mix temperature shall be between 50°F and 90°F when cement is added. Maintain a concrete temperature of 50°F minimum for 72 hours after placing, or until concrete has thoroughly hardened. When necessary, heat concrete materials before mixing. Take necessary precautions to protect transit-mix concrete.
      b. Hot Weather: 90°F maximum.

B. Protection:
   1. Do not place concrete during rain, sleet, or snow unless protection is provided.
   2. After placement, protect from injury by elements, traffic, construction operations and other causes.

C. Sequencing, Scheduling: Coordinate work with earthwork, trenching for foundations, underground utilities, plumbing, electrical, mechanical, imbedded items, steel reinforcement and related work of other sections.

PART 2 - PRODUCTS

2.01 MATERIALS; GENERAL

Conform to Codes and additional requirements stated herein.

2.02 BASIC CONCRETE MATERIALS

A. Portland Cement:
   1. Type II; per Title 24, Section 1903A.5 and modified ACI 318 Section 3.3.2.
   2. Use tested cement only per Section 1903A. Use same cement brand for all exposed work.
   3. Recycled content shall be maximum 15% (15% flyash per DSA IR 19-3 and 10% reclaimed aggregate per DSA IR 19-4).

B. Water: Clean, fresh, free of injurious amounts of minerals, organic, substances, salts, acids or alkali.

C. Aggregates:
   1. General: Per Title 24, Section 1903A.

2. Aggregates: Per CBC Section 1903A.3.3.
    a. Fine: Sand; well graded from coarse to fine.
        1) 15% Flyash: Per CBC Section 1903A.4, ACI 318-05, ASTM C618-12a, ASTM C311/C311M-13 and ASTM C94/C94M-13a.
    b. Coarse: Uniformly graded from 1/4" to maximum permissible size. Maximum size per Title 24, Section 1903A.3, but not to exceed 1-1/4". See Structural Drawings.
    c. Combined grading shall meet Table 19A-J, Title 24, Part 2.
3. The nominal maximum size of coarse aggregate shall not be larger than one-fifth the narrowest dimension between sides of forms, nor one-third the depth of slabs, nor three-fourths the minimum clear spacing between individual reinforcing bars or wires, bundles of bards, or Pre-stressing tendons or ducts.

2.03 ADMIXTURES

A. Inclusion of admixtures in concrete mix is at Contractor's Option and expense. Types shall conform to the following:
    1. Conform to Title 24, Section 1903A.5. Admixtures shall increase workability and reduce water demand.
    2. Acceptable Products:
        a. Floor slabs-on-grade: Red Label or Anti-Hydro International Inc. or approved equivalent. Mix per manufacturer's recommendations.

2.04 CONCRETE SURFACE TREATMENTS

A. Liquid Curing Compounds:
    1. General: Conform to ASTM C309-11.
    2. Acceptable Manufacturers: Hunt Process Co., Edoco/Burke Construction Chemicals, Scofield, Sonneborn (Degussa Construction Chemicals); US Spec (US Mix Products Co.).
    3. "Clear", Oxidizing Type (For exterior areas): Hunt "Clear #ARB" as a standard of quality.

B. Liquid Curing Compound (for interior slabs):
    1. General: Penetrating curing compound.
    2. Acceptable manufacturers: Curranseal, Innerseal.
    3. Acceptable Products:
        a. Curranseal PM 3300 (714) 641-1121.
        b. Innerseal DPS; 800-999-9385.
        c. No other substitutions allowed.
    4. Apply penetrating sealer within 24 hours of slab placement while concrete is still "green."
    5. Application of compound shall be by a trained applicator acceptable to the compound manufacturer.
    6. Provide manufacturer's standard 10 year warranty covering both labor and materials necessary to repair floor slab, repair or replace floor finish if repairs cannot be made.
    7. Repair all cracks in interior slabs with "crack chaser" saw, fill crack with sealant. This requirement shall be provided prior to application of finish floor materials and is required to validate manufacturer's 10 year warranty.

2.05 WOOD FORMWORK

A. Grade Marks and Rules for Lumber and Plywood: Per Specifications Sections 03 11 00 - Concrete Formwork and 06 10 00 - Rough Carpentry.

B. Boards For Unexposed Concrete and Basic Forms: Douglas Fir, S4S; Standard Grade or better.

C. Form Coatings and Release Agents:
   1. Per manufacturer's recommendations, suitable for type of form materials and finished concrete surface.
   2. Materials shall not stain or change color of exposed concrete.
   3. Materials shall be compatible with finishes to concrete.

2.06 ACCESSORIES AND MISCELLANEOUS

A. Non-Shrink Grout (Drypack Under Base Plates): Five Star high early strength grout by U.S. Grout Corporation. The grout shall be mixed and installed in accordance with manufacturer's recommendations. Tensile strength (ASTM C307-03(2012)): 2000 psi; Flexural strength (ASTM C580-02(2012)): 4000 psi.

B. Epoxy Adhesive: Simpson Epoxy-Tie ET-High Strength Adhesive or Hilti Equal. Two component solid epoxy system meeting minimum requirements of ASTM C881/C881M-10 specification for Type I, II, IV, and V, Grade 3, Class B and C.
   1. Compressive Yield Strength: 13,390 psi minimum at 7 days per ASTM D695-10.
   2. Heat Deflector Temperature: 168° (76°C) minimum per ASTM D648-07.
   3. Bond Strength: 4,420 psi at 14 days per ASTM C882/C882M-13.
   4. Codes: ESR-3372; SBCCI-94145; City of Los Angeles RR25185, RR25120.

C. Concrete Stair Nosing: Refer to Section 05 50 00 - Metal Fabrications.

D. Vapor Barrier Membrane under interior concrete slabs:
   1. Membrane shall be Stego Wrap 15 mil as manufactured by Stego Industries (949) 257-4100.
      a. Acceptable Manufacturer: Vaporguard by Reef Industries.

2. Vapor barrier membrane shall have the following properties.
    a. Permeance as tested after mandatory conditioning (ASTM E154/E154M-08a(2013)e1, Section 8, 11, 12, 13) less than 0.01 Perms.
    b. Strength: ASTM E1745 Class A.
    c. Thickness: 15 mils minimum.
    d. Installation shall be in accordance with ASTM E1643-11 and manufacturer's instructions.

2.07 MIXES, CONCRETE

A. Mix Proportioning:
    1. General:
        a. Non-designed Mix, per Title 24, Section 1905A.8 which refers to ACI 318 Section 2.
        b. Design shall include admixtures and/or additives. Use as approved by DSA.
        c. Do not add salt, chemicals, or other materials to prevent freezing.
    2. Strengths, Proportions and Criteria: Typical for all locations; except where higher strengths are indicated on the Drawings.
        a. Strength: 3,000 psi at 28 days; 1,800 psi at 7 days.
        b. Cement Content: Minimum 6 sacks (94#) cubic yard.
        c. Slump: Maximum four inches.

B. Mixing:
    1. General: Per Title 24, Section 1905A.8 which refers to ACI 318 Section 5.8 and Section 5.2.
    2. Batch Mixed: Use ASTM C94 batch mixer; or capacity to handle one or more full sack batches. No split-sack batches.
    3. Transit Mixed: Per CBC 2013 edition Section 1905A.9 which refers to ACI 318 section 5.9.
    4. Mix concrete only in quantities necessary for immediate use.
    5. Do not retemper concrete.
    6. Discharge wash water from mixer before reloading.
    7. Include additives and admixtures.

PART 3 - EXECUTION

3.01 INSPECTION

A. Examine excavations for foundations, footings, and structures and examine earthwork operations and subgrade for defects that will adversely affect the execution and quality of work.

B. Verify anchors, seats, plates, reinforcement, and other items to be cast into concrete are accurately placed, held securely, and will not cause hardship in placing concrete.

C. Do not start work until unsatisfactory conditions are corrected.

3.02 PREPARATION

A. Layout: Accurately layout work to properly position elements to lines and levels.

B. Joining To Previous Pours or Existing Work: Sandblast, roughen and clean existing joining concrete and rebar surfaces to provide a proper bond to new work.

C. At locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels, and pack solid with epoxy cement.

D. Slabs-on-Grade:
   1. Refer to Section 31 00 00, Earthwork.
   2. Moisten surface sufficiently to prevent suction of water from concrete mix, except where a membrane is used.
   3. All interior slabs-on grade shall be poured over 6 mil visqueen vapor barrier membrane protected with 1" of sand overlay over crushed rock porous fill. Vapor barrier shall conform to ASTM E1745-09.

3.03 FORMWORK ERECTION

A. Scope:
   1. General: Concrete shall be cast in forms.
   2. Footings: When specifically approved by Architect/Engineer and DSA, earth banks may be used as forms in lieu of wood forms.

B. Form Face Types: Plywood or horizontal boards.

C. General Construction:
   1. Forms shall be substantial, unyielding, true to line and level; sufficiently tight to prevent leakage; adequately tied and braced; and conform exactly to dimensions of finish concrete.
   2. Forms shall provide adequate work clearances, temporary access openings necessary for concrete placement, provisions for attachment to previous work; and provide for stripping without injury to concrete work.
   3. Cleanouts: Provide continuous cleanouts on one side at bottom of vertical work (such as walls), and other openings as necessary to facilitate cleaning and inspection of the work.

D. Fabrication:
   1. Nail form faces securely to studs. Space studs to adequately support form faces and prevent bulging. Provide stud or solid backing at joints.
   2. Install chamfer strips at exposed corners and edges.
   3. Securely fasten chamfers, control joints and other detail work.

E. Erection:
   1. Erect formwork plumb and level; double walls; adequately brace, shore and support; set so finished concrete surfaces will drain.
   2. Footings and Foundation Walls: Form both sides; secure to stakes.

F. Form Coatings and Release Agents: Apply per manufacturer's recommendations to evenly coat contact surfaces.

3.04 EMBEDDED ITEMS

A. General:
   1. Install per Title 24, Section 1906A.
   2. Place accurately; anchor securely to prevent displacement.
   3. No wood to be permanently embedded in concrete, except where indicated.
   4. Coordinate, notify, and provide access for other Specifications Sections to set their required work.
   5. Install doweling with epoxy adhesive per manufacturer's recommendations.
   6. Install safety treads and nosing specified in Section 05 50 00 - Metal Fabrications, embedded in wet concrete mix per the manufacturer's recommendations in the exterior, cast-in-place concrete steps as located on the Drawings.

3.05 CONCRETE PLACEMENT

A. General: Comply with Title 24, Section 1905A.10 which refers to ACI 318, Section 5.10.

B. Notify Architect and the Inspector of Record minimum 48 hours prior to commencement of all concreting operations.

C. Preparation and Inspection Prior to Concrete Placement:
   1. Do not place concrete until:
      a. Footing excavations are clean and dry.
      b. Steel reinforcement is correctly positioned, securely anchored and cleaned.
      c. Forms are cleaned, coated, and ties are tightened.
      d. Embedded items are positioned and anchored.
      e. Construction joints are cleaned and prepared.
      f. Subgrade is prepared and moistened.
      g. Preparations for a pour are completed.
      h. Work has been inspected.
   2. Inspection: Formwork, steel reinforcement, footing excavations and preparation work, as stated above, to be examined by the IOR and/or Architect/Engineer, prior to pouring concrete.

D. Placement (per CBC Section 1905A.10):
   1. Convey concrete from mixer to final position by method which will prevent separation or loss of material and cause minimum handling.
   2. Place concrete continuously between predetermined construction and control joints.
   3. Regulate rate of placement so concrete remains plastic and flows into position.
   4. Do not use partially hardened or contaminated concrete; and do not use concrete which has been remised after initial set.

E. Consolidation:
   1. Use hand rodding, spading and tamping.

2. Vertically insert and remove hand-held tools.
3. Work concrete thoroughly around reinforcement, embedded items and into all parts of forms.
4. Consolidate to a dense, uniform mass without voids, rock pockets, or entrapped air. Consolidate each layer.
5. Mechanically powered vibrators may be used. Such use shall be limited to vertical consolidation of concrete over 8" thick and all walls. Do not use to move concrete laterally or in any other means that may cause aggregate separation.

F. Slabs, Walks and Flatwork:
1. Lift reinforcement at placement progresses to proper position in slab.
2. Tamp and screed to required lines and levels.
3. Depress coarse aggregate with grille-blade tamper.

3.06 FINISHING

A. Provide concrete formed surfaces to be left exposed with smooth rubbed finish.

B. Interior Flatwork (Floor slabs):
1. Smooth trowel finish surface texture unless otherwise indicated to receive ceramic tile, terrazzo, a concrete topping, or other surfacing which would benefit from the additional bonding of a comparatively rough surface.
2. Grind smooth any irregularities or improper levels in finished work.

3.07 FINISHING WALLS AND VERTICAL CONCRETE SURFACES

A. Scope: Finish walls and vertical concrete surfaces as specified herein, except for school name and office signs. Provide concrete formed surfaces, to be left exposed, with smooth rubbed (sacked) finish.

B. Exposed Concrete At Tops of Forms:
1. Strike concrete smooth and level.
2. Float and/or trowel to texture comparable to formed surfaces.

C. Preparation, Formed Surfaces:
1. Remove fins and irregularities while concrete is green.
2. Tie Holes: Fill full and flush with compacted drypack.
3. Surface Defects:
a. Cut out blemished and defective areas as directed by Architect.
b. Patch flush with drypack, typically, or as directed by Architect.

D. Cleaning:
1. Exposed Surfaces:
a. Remove form coatings, bond breakers and other surface coatings.
b. Scrub formed surfaces with solution of 1-1/2 lbs. caustic soda to one-gallon water.
c. Scrub smooth wood or waste mold areas with 20% muriatic or hydrochloric acid solution.
d. Wash surfaces clean with clear water, immediately after scrubbing.

e. If above methods fail to remove all substances, lightly sandblast surfaces clean as directed by Architect.

2. Surfaces With Finish Materials Applied Directly to Concrete: Clean as stated for Exposed Surfaces, except where uncleaned surface will not affect application, bond, performance, or appearance of finish materials.

E. Sacked Finish on Exposed Concrete:
   1. General: Schedule work to complete entire panel, element, or area in one continuous operation.
   2. Application:
      a. Wet surface to control suction of water from grout.
      b. Apply grout mix; uniformly spread and scour to fill depressions.
      c. While still plastic, sponge rubber float finish surface, and remove excess grout.
   3. Sacking: Allow surface to dry, but not completely harden. Then rub vigorously with clean dry burlap to remove loose excess material. Finished surface to have a smooth slick burnished finish (similar to a steel trowel finish) which is free of defects and blemishes.

3.08 PROTECTION AND CURING OF CONCRETE

A. Protection: Protect work from damage and defacement during construction operations.

B. Curing:
   1. Keep concrete surfaces wet until curing medium is applied.
   2. Flatwork:
      a. Spray apply specified liquid curing compounds to exterior flatwork (slabs, walks, and similar work).
      b. Application: Apply uniform, continuous, tightly adhered film, free from pinholes or defects at rate of 1 gallon per 250 sq. ft. Brush out puddles and runs.
   3. The length of time, temperature and moisture conditions for curing concrete shall be in accordance with Section 1905A.11 which refers to ACI 318 Section 5.11.

3.09 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Section 01 45 00, Quality Control and Testing Services.

B. Inspections:
   1. Steel reinforcement.
   2. Structural concrete.

C. Tests:
   1. Concrete slump.
   2. Making concrete compression test cylinders.
   3. Core tests of defective work.

3.10 ADJUSTMENT AND CLEANING

A. Correction of Defective Work:
   1. Work not conforming to Contract requirements shall be removed and replaced except where patching or other remedial work is specifically permitted by Architect. Contractor shall bear costs of correction of defective work.
      a. Surface patching materials and methods shall be as approved by Architect.
      b. Structural concrete replacement, strengthening, and repair methods and materials shall be as approved by Architect/Engineer and DSA.

B. Clean exposed joint surfaces to receive joint sealant per Section 07 92 00.

C. Clean exposed surfaces prior to acceptance.

3.11 CONSTRUCTION JOINTS

A. Comply with Section 1906A.4, CBC, latest edition.

END OF SECTION

PART 1 - GENERAL

1.01 REFERENCE

Title 24, California Code of Regulations requires that where high lifting is used the method is to be approved by the Division of the State Architect (DSA).

1.02 DESCRIPTION

A. The High Lift Grouting Method as developed for use in reinforced concrete block masonry is intended for use on wall construction where openings, block pattern arrangements, special reinforcing steel, or embedded structural steel details do not prevent the free flow of grout or inhibit the use of mechanical vibration to properly consolidate the grout fill in cells or horizontal grout spaces. Horizontal reinforcing should be positioned in a single vertical plane at each curtain steel to allow maximum accessibility to the cell spaces.

B. The procedure requires that masonry units, reinforcing steel and embedded items will be in place before grouting of the wall voids commences. The work should be so arranged that once grouting of a section of wall is started the grouting is to proceed in lifts without stopping except as noted below until the full height of the prepared section is poured. The waiting period between lifts is to be limited to the time required to obtain an initial consolidation of grout due to settlement shrinkage and absorption of excess water by the masonry units. This also allows for a reduction in hydrostatic pressure of the grout on the masonry unit and reduces the possibility of blowouts.

C. The grout shall be a high slump workable mix preferably placed by pumping to permit continuous pouring and is to be worked into all voids. Use mechanical vibrators for consolidation. Where job conditions preclude such use, other methods may be employed if approved by the DSA. Because of the high water-cement ratio used in this type of grout, it is essential that the grout be reconsolidated after it has taken on a plastic consistency but prior to taking an initial set. The reconsolidation is intended to overcome settlement shrinkage separations from the reinforcing steel and to promote bond to the masonry unit walls.

D. A pour is considered as the entire height of grout fill placed in one day and is composed of a number of successively placed grout lifts. A lift is the layer of grout placed in a single continuous operation.

E. The maximum height of pour is limited by the practical considerations of segregation of grout due to the height of free fall, effect of dry grout deposits left on block projections and reinforcing steel and the ability

to effectively reconsolidate the grout. Unless specifically approved otherwise the maximum height of the continuous pour will be done in lifts not exceeding 4 feet up to 12' for 8" walls and 16' for 12" walls. Conform to requirements of CBC Section 2104A.6.1.2.3, and DSA IR 21-2.

1.03 QUALITY ASSURANCE

Materials are to conform to Section 2104A and 2103A, CBC, 2013 Edition, Title 24.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Gravel Aggregate: Gravel aggregate for grout is to conform to CBC, 2010 Edition, Section 2103A.12.3 which refers to ASTM C404-11, coarse aggregate, except when other gradings are specifically approved by the Architect or Structural Engineer, and the DSA.

B. Coarse Aggregate: Coarse aggregate is to conform to Section 1903A.3 CBC, Title 24, which refers to modified ACI 318, Section 3.3.2.

C. Admixture: Use an approved grout admixture of a type that reduces early water loss to the masonry units and produces an expansive action in the plastic grout sufficient to offset initial shrinkage and promote bonding of the grout to interior surfaces of the masonry units. Obtain approval for use of the admixture from the Architect/Engineer and the DSA.

D. Mortar: Mortar is to comply with the requirements of CBC Section 2103A.8, Title 24; and with the following additional requirements:
   1. Place approximately half the required water and sand into the mixer while running.
   2. Add cement and the remainder of the sand and water into the mixer in that order and mix for a period of at least two minutes.
   3. Add lime and continue mixing as long as needed to secure a uniform mass.
   4. The total mixing time may not be less than ten minutes.

E. Grout: The grout mix is to comply with the requirements of Title 24, CBC Section 2103A.12.
   1. Sufficient water may be added to make a workable mix that will flow into joints of the masonry without separation or segregation. When grout is to be placed in masonry units with typical rates of absorption, the slump of the grout should be approximately 9" to 10" depending on temperature and humidity conditions.

2. Where the least lateral dimension of cells to be filled exceed 5", a coarser aggregate may be used in the grout fill of the mix if designed in accordance with Section 1904A, CBC. The maximum size of aggregate is not to exceed 1". The water per sack of cement shall conform to 1904A.1, which refers to ACI 318 Section 4.1, CBC Title 24 to allow for absorption by the masonry units and with sufficient workability to meet the requirements given in the paragraph above.
3. Grout mixes are to contain an approved admixture conforming to the requirements of this Section and IR 21-2. Use such admixture in accordance with manufacturer's instructions.
4. Mixing of Grout: The mixing of grout is to conform to the requirements for mixing of concrete, Section 2103A.12, CBC Title 24. Whenever possible mix and deliver grout in accordance with the requirements for transit-mixed concrete. Time the addition of the admixture in strict accordance with the manufacturer's instructions. The procedure used for adding it to the grout mix is to provide for good dispersion.
5. Certification: The quality and quantities of materials used in transit-mixed grout are to be continuously checked by a qualified person at the location where the materials are measured.
6. If specified by the Architect or Structural Engineer and approved by the Division of the State Architect, certification concerning quantity of materials may be accepted from a licensed weighmaster in lieu of continuous plant inspection if the following procedures are used to check the quality of the materials to be used in the grout.
    a. Test samples of the aggregate to be used in the grout are to be taken and tested by the testing laboratory in accordance with ASTM C1019-13.
    b. The transit-mixed grout supplier uses a mix design for the proportions of cement, sand, and pea gravel or coarser aggregate prepared or approved by the project Architect/Engineer.
    c. On the first half-day transit-mixed grout is supplied to the job, and at such other times as may be required by the Architect/Engineer, the quantity and quality of materials used in the transit-mixed grout is continuously checked by an approved inspector at the batch plant location. In addition to the quality of the aggregates, the inspector is to verify the quality of the cement.
    d. The licensed weighmaster will certify to each load on a load ticket transmitted to the District's Inspector and furnish an affidavit at the completion of the project.
    e. Tests: Testing of mortar and grout is to conform to the requirements of Section 2105A.4 of CBC, Title 24.

PART 3 - EXECUTION

3.01 CONSTRUCTION

The construction of high lift concrete block masonry work is to conform to the requirements of CBC, Title 24, Section 2104A.5.1.2.3, with the following additional requirements:

A. Foundations: The contact surface of foundations and floors that are to receive masonry work are to be thoroughly cleaned and roughened in accordance with Section 1906A.4.1, Title 24, CBC before start of laying. Protect the roughened surface during construction to assure a good bond between the grout fill and the concrete surface.

B. Cleanouts: Conform to the requirements of Section 2104A.5.1.1.3.3, CBC. Provide for each pour by leaving out every other unit in the bottom tier of the section being poured or by cleanout openings in the foundation. The openings are to be made prior to the start of laying and be of sufficient size and location to allow thorough flushing away of mortar droppings and debris. After laying of masonry units is completed, the cells cleaned, the reinforcing positioned and inspection completed, close the cleanouts by inserting face shells of masonry units or covering the openings with forms. Face shell plugs are to have a two day minimum curing time and be adequately braced during grouting to resist the pressure of the fluid grout.

C. Reinforcement: Place reinforcing steel accurately in strict accordance with the approved Plans and Specifications. Both horizontal and vertical reinforcing are to be held in position by wire ties or spacing devices near ends and at intervals not exceeding 192 diameters of the reinforcement. Place the horizontal reinforcing as the work progresses. The vertical reinforcing may be dripped into position after the completion of the laying if adequate positioning devices are provided to hold the reinforcement in proper location.

D. Masonry Units: Use of open end concrete masonry units is preferred wherever possible and is required for stacked bond. Bond beam units are to be used wherever possible to facilitate the horizontal flow of grout and are required at all horizontal bars to provide a minimum vertical opening at cross web 3" high by 3" wide. The concrete masonry units shall not be wetted before laying except in hot, dry areas where the contact surfaces of the units shall be moistened immediately before laying to prevent excessive drying of mortar. Wetting shall be limited so as not to compromise the compressive strength of the mortar. Refer to ASTM C270-97a, Appendix XI, "Selection and Use of Mortar for Masonry Units."

E. Laying: Conform to the requirements of Section 2104A.5.1.2.1, CBC. Fill head and bed joints solidly with mortar for a distance in from the face of the unit not less than the thickness of the face shell. Care is to be taken in placing the mortar to keep a minimum of droppings from falling into the block cells. Arrange open end concrete masonry units used in stacked bond so the closed ends are not abutting.

F. Wall Ties and Bracing: Conform to the requirements of Section 2104A.5.1.2.1, CBC. When stacked bond is used or when adequate cross webs between face shells are not provided, ties of heavy gauge wire embedded in the horizontal mortar joints should be provided across continuous vertical joints or between face shells to prevent blowouts due to the hydrostatic pressure of the fluid grout. External ties or braces may also be used for this purpose. During construction, brace the ungrouted walls adequately to resist wind and other forces.

G. Mortar Droppings and Overhangs: Thoroughly remove mortar droppings and overhangs from the foundation or bearing surface, cell walls and reinforcing. Acceptable methods for this are by hosing with a jet stream at least twice a day (at mid-day and quitting time) or by providing a 2" or 3" blanket of dry sand over the exposed surface of the

foundation, dislodging any hardened mortar from the cell walls and reinforcing with a pole or rod and removing the mortar debris with the sand cover prior to clean up and grouting.

H. Construction Joints: In the high lift grouting method, intermediate horizontal construction joints are not permitted. Plan the work for one continuous pour of grout to the top of the wall in 4' layers or lifts in the same working day. Should a blowout, a breakdown in equipment, or any other emergency occur, cease the grouting operation. An alternate procedure may be used with the approval of the Architect/Engineer and the DSA. The section of wall to be grouted in any one pour should be limited to a length in which successive lifts can be placed within one hour of the preceding lifts. Vertical control barriers shall be placed between pour sections in locations approved by the Architect/Engineer and the DSA.

I. Grouting: Conform to the requirements of Section 2104A.5.1.1.3, CBC. To prevent blowouts, pour no grout until the mortar has set and cured. However, grout the walls as soon as possible after mortar has cured to reduce shrinkage, and cracking of the vertical joints. Cleanout closures, reinforcing, bolts and embedded connection items are to be in position before grouting is started. Handle grout from the mixer to the point of deposit in the grout space as rapidly as practical by pumping and placing methods which will prevent segregation of the mix and cause a minimum of grout splatter on reinforcing and masonry unit surfaces not being immediately encased in the grout lift. The grout space in masonry shall be a minimum of 3-1/2 inches. Reinforcing and wire ties shall be embedded in the grout. The thickness of the grout between masonry units and reinforcing shall be a minimum of one bar diameter. Vertical grout barriers or dams shall be built of solid masonry across the grout space the entire height of the wall to control the flow of the grout horizontally. Grout barriers shall not be more than 30 feet apart. Depending upon weather conditions and absorption rates of the masonry units, the lift heights and waiting periods may be varied. Under normal weather conditions with typical masonry units, the individual lifts of grout are limited to 4' in height with a waiting period between lifts of 30 to 60 minutes. Place the first lift of grout to a uniform height within the pour section and mechanically vibrate thoroughly to fill voids. The grouting team should be organized to enable the vibration to follow closely behind and at the same pace as the pouring operation. After a waiting period sufficient to permit the grout to become plastic but before it has taken any set, the succeeding lift should be poured and alternate cells vibrate 12" to 18" into the preceding lift. Do this in such a manner as to reconsolidate the preceding lift and close any plastic shrinkage cracks or separations from the cell walls. If, because of unavoidable job conditions, the

placing of the succeeding lift is going to be delayed beyond the period of workability of the preceding lift, reconsolidate each lift by reworking with the mechanical vibrator as soon as the grout has taken its settlement shrinkage. Repeat the waiting, pouring and reconsolidate steps until the top of the pour is reached. Reconsolidate the top lift also after the required waiting period to fill any space left by settlement shrinkage.

J. Cleaning Wall: Immediately after the wall has been fully grouted, hose off with water under pressure through a jet nozzle, the scum and stains which have percolated through the blocks and joints.

K. Curing: Attention should be given to proper curing of the mortar joints as well as the grout concrete pour. The concrete block work and top of grout pour should be kept damp to prevent too rapid drying during hot or drying weather, and drying winds.

3.02 INSPECTION AND CORE TESTS

A. Inspection: Masonry work is required to be continuously inspected during laying and grouting by an inspector specially approved for the purpose by the DSA. The inspector makes test samples and performs such tests as are required by this Section. The special masonry inspector is to check the materials, details of construction and construction procedure. He will furnish a verified report that, of his own personal knowledge, the work covered by the report has been performed and materials used and installed in every particular in accordance with and in conformity to the duly approved Drawings and Specifications.

B. Core Tests: Take core tests of the completed masonry construction in accordance with Section 2105A.4, CBC, Title 24. The Inspector of Record (IOR) or testing agency is to inspect the coring of the masonry walls and prepare a report of coring operations for the testing laboratory files and mail one copy to the DSA. Not less than two (2) cores having diameter of 6" shall be taken from each Project. Two (2) cores shall be taken from each building for every 5000 sq ft of masonry wall or floor area, whichever is greater, or a fraction thereof; conforming to Section 2105A.3.1, CBC. State in this report the number, the location and the condition of cores on the Project. Pay particular attention to the description of the bond between the grout fill and the cell walls of the masonry unit. The report should also include a description of any difficulties encountered in the coring operation which might impair the strength of the sample. Submit cores to the testing laboratory for examination. If specifically requested by the Architect/Engineer, 1/3 of the cores will be tested for the bond strength of the joint between the masonry units and the grout. This test determines the unit force required to shear the masonry unit face shells from the grout core for each face.

END OF SECTION