



**SPECIFICATIONS TO PROVIDE
FOR THE CONSTRUCTION OF
MCKINLEY PARK RENOVATIONS
PROJECT
FOR THE CITY OF STOCKTON, CALIFORNIA
PUBLIC WORKS DEPARTMENT**

**PROJECT NO.
WR21017**

**MCKINLEY PARK RENOVATION
PROJECT NO. WR21017**

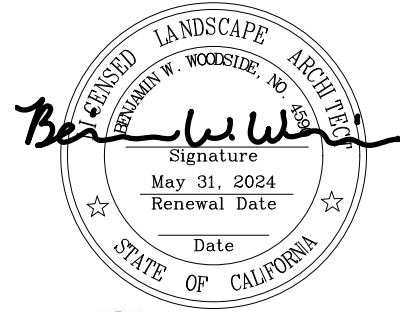
The special provisions contained herein have been prepared by, or under the direct supervision of, the following:

LANDSCAPE ARCHITECT

SIGNED: Benjamin W. Woodside

Registered Landscape Architect

DATE: 11/14/2022



CIVIL ENGINEER

SIGNED: Jeff Kilde

Registered Civil Engineer

DATE: 11-15-2022



ARCHITECT

SIGNED: [Signature]

Registered Architect

DATE: 11/16/2022



ELECTRICAL ENGINEER

SIGNED: Jeffrey H. Ansley

Registered Electrical Engineer

DATE: 11/15/2022



AQUATICS ARCHITECT

SIGNED: [Signature]

Registered Architect

DATE: 11/16/2022

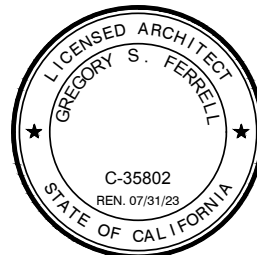


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**SPECIAL PROVISIONS
FOR
MCKINLEY PARK AND POOL RENOVATION
PROJECT NO. WR21017**

DIVISION I – GENERAL PROVISIONS

SECTION 1 – GENERAL

1-1.01 TERMS AND DEFINITIONS

Wherever in the Standard Specifications, Special Provisions, Notice to Contractors, Proposal, Contract, or other contract documents the following terms are used; the intent and meaning shall be interpreted as follows:

City or Owner - shall mean “City of Stockton” and the authorized representatives acting on the City’s behalf.

Director - shall mean the Director of Public Works, City of Stockton

Standard Specifications - City of Stockton, Standard Plans and Specifications, and any amendments or revisions thereto (latest edition)

Caltrans Specifications - State of California, Department of Transportation, 2018 Standard Plans and Specifications and any amendments or revisions thereto.

Laboratory - City of Stockton's Department of Public Works or consultant laboratory

Department - Department of Public Works, City of Stockton

Engineer - City Engineer, City of Stockton, acting either directly or through properly authorized Engineer agents and consultants

Landscape Architect - Project Landscape Architect, Callander Associates Landscape Architecture, Inc.

Geotechnical Engineer - Project Geotechnical Engineer, Geocon Consultants

MUTCD - Latest edition of California Manual on Uniform Traffic Control Devices (MUTCD), and any amendments and revisions thereto

Working Day - defined as any eight-hour day, except as follows: Saturday, Sunday, and City recognized holidays

1-1.02 SPECIFICATIONS

The work described herein shall be done in accordance with the current City of Stockton, Department of Public Works Standard Specifications and Plans, and the latest Editions of the State of California, Department of Transportation Standard Specifications and Standard Plans, California MUTCD, 2019 California Building Code (CBC), 2019 California Mechanical Code, 2019 California Electrical Code, 2019 California Energy Code, 2019 California Plumbing Code, 2019 California Fire Code and the Americans with Disabilities Act (ADA) Standards for Accessible Design as referenced therein, and in accordance with the following Special Provisions. To the extent the California Department of Transportation Standard Specifications implement the STATE CONTRACT ACT, they shall not be applicable since the City of Stockton is not subject to said ACT.

In case of conflict or discrepancy between any of the Contract Documents, the order of documents listed below shall be the order of precedence, with the first item listed having the highest precedence.

- a. Contract Change Order
- b. Contract
- c. Project Special Provisions (including Appendices)
- d. Project Plans
- e. City's Standard Specifications
- f. City's Standard Drawings
- g. Revised Caltrans Standard Specifications
- h. Caltrans Standard Specifications
- i. Revised Caltrans Standard Plans
- j. Caltrans Standard Plans
- k. Supplemental Project Information

With regards to discrepancies or conflicts between written dimensions given on drawings and the scaled measurements, the written dimensions shall govern.

With regards to discrepancies or conflicts between large-scale drawings and small-scale drawings, the larger scale shall govern.

With regards to discrepancies or conflicts between detailed drawings and referenced standard drawings or plans, the detailed drawings shall govern.

In the event where provisions of codes, safety orders, contract documents, referenced manufacturer's specifications or industry standards are in conflict, the more restrictive and higher quality shall govern.

Should it appear that the work to be done or any of the matters relative thereto are not sufficiently detailed or explained in these specifications, the special provisions, or the plans, the Contractor shall apply to the Engineer in writing for such further explanations as may be necessary and shall conform to them as part of the contract. All responses from the Engineer shall be in writing. In the event of any doubt or question arising respecting the true meaning of these specifications, the special provisions or the plans, reference shall be made to the Engineer, whose decision thereon shall be final.

The Contractor shall examine carefully the site of the work and the plans and specifications therefore. He/She shall investigate and satisfy himself/herself as to conditions to be encountered, the character, quality and quantity of surface, subsurface materials or obstacles to be encountered, the work to be performed, materials to be furnished, and as to the requirements of the bid, plans and specifications of the contract.

1-1.03 PLANS

The bidder's attention is directed to the provisions in Section 1-1.03, "Definitions" of the Standard Specifications and Section 1-1.07 of the Caltrans Specifications.

See Instructions to Bidders for complete instructions and documentation forms.

SECTION 2 – BIDDING

2-1.01 GENERAL

The bidder's attention is directed to the "Notice to Contractors" for the date, time and location of the mandatory pre-bid meeting, if applicable. Refer to the City of Stockton's Bid Flash webpage:

<http://www.stocktongov.com/services/business/bidflash/default.html>

The bidder's attention is directed to the provisions in Section 2, "Bidding," of the Standard Specifications and these special provisions for the requirements and conditions which the bidder must observe in the preparation for the submission of the bid.

The Bidder's Bond form mentioned in the last paragraph in Section 2-1.34, "Bidder's Security," of the Standard Specifications will be found following the signature page of the Proposal.

In conformance with Public Contract Code Section 7106, a Non-collusion Affidavit is included in the Proposal. Signing the Proposal shall also constitute signature of the Non-collusion Affidavit.

The contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of Title 49 CFR (Code of Federal Regulations) part 26 in the award and administration of US DOT assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy, as the recipient deems appropriate. Each subcontract signed by the bidder must include this assurance.

2-1.02 BID PROTEST

In case of Bid protests, attention is directed to the provisions in Section 2-1.51, "Bid Protests" of the Standard Specifications. The party filing the protest must have submitted a bid for the work. A subcontractor of a bidder may not submit a bid protest.

A copy of bid protests is to be sent to the following address:

Attention: Ivan Reynoso
City of Stockton
Public Works Department
22 E. Weber Avenue, Room 301
Stockton, CA 95202

SECTION 3 – CONTRACT AWARD AND EXECUTION

3-1.01 CONTRACT AWARD

The bidder's attention is directed to the provisions in Section 3, "Contract Award and Execution," of the Standard Specifications and these special provisions for the requirements and conditions concerning award and execution of contract.

Bid protests are to be delivered to the following address: Department of Public Works, 22 E. Weber Avenue, Room 301, Stockton, CA 95202, Attn: Mohammad Sadiq. The award of the contract, if it be awarded, will be to the lowest responsible bidder whose proposal complies with all the requirements prescribed.

3-1.02 CONTRACT EXECUTION

The contract shall be executed by the successful bidder and shall be returned, together with the contract bonds, to the Agency so that it is received within 10 days, not including Saturdays, Sundays and legal holidays, after the bidder has received the contract for execution. Failure to do so shall be just cause for forfeiture of the proposal guaranty. The executed contract documents shall be delivered to:

City of Stockton
Public Works Department
Attn: Ivan Reynoso
22 E. Weber Avenue, Room 301
Stockton, CA 95202

3-1.03 CONTRACT BONDS

Contract Bonds shall conform to the requirements set forth in Section 3-1.05, "Contract Bonds", of the Standard Specifications, except for the second paragraph which shall be replaced with the following:

"The Faithful Performance bond will be retained by the City of Stockton for twelve (12) months following recordation of the Notice of Completion (or partial completion) to guarantee correction of failure attributed to workmanship and materials. Upon recordation of the Notice of Completion (or partial completion), the amount of the Faithful Performance bond may be reduced to **ten percent (10%)** of the actual cost of the constructed improvements".

SECTION 4 – SCOPE OF WORK

Attention is directed to the provisions in Section 4, "Scope of Work" of the Caltrans Specifications, Standard Specification, and these Special Provisions.

At no time shall construction begin without receiving notice that the contract has been approved by the City Attorney or an authorized representative. The Contractor shall follow the sequence of construction and progress of work as specified in Section 10-1.01, "Order of Work", of these Special Provisions.

The Contractor shall diligently prosecute all work items to completion.

Full compensation for any additional costs occasioned by compliance with the provisions in this section shall be considered as included in the lump sum price paid for the work, and no additional work compensation will be allowed therefore.

Bidders will be required to carefully examine these special provisions and attachments to judge for themselves as to the nature of the work to be done and the general conditions relative thereto and the submission of a proposal hereunder shall be considered prima-facie evidence that the bidder has made the necessary investigation and is satisfied with respect to the conditions to be encountered, the character, quantity and quality of the work performed. For work to be completed, contractors are advised to visit and review the job site prior to the submission of their bid. Bids not presented on the City forms shall be cause for considering the bid as non-responsive.

Bidders must be thoroughly competent and capable of satisfactorily performing the work covered by the proposal, and when requested shall furnish such statements relative to previous experience on similar work, the plan or procedure proposed, and the organization and the equipment available for the contemplated work, and any other as may be deemed necessary by the City Engineer in determining such competence and capability.

It shall be understood that the Contractor shall be required to perform and complete the proposed work in a thorough and diligent manner, and to furnish and provide in connection therewith all necessary labor, tools, implements, equipment, materials and supplies. The Contractor is responsible to take all necessary precautions and use best practices in the industry to perform all work require completing the project.

4-1.01 DIFFERING SITE CONDITIONS (29 CFR 635.109)

Attention is directed to the provisions in Section 4-1.06, "Differing Site Conditions," of the Caltrans Specifications and the Standard Specifications. Contractor shall notify the

Engineer if he/she finds physical conditions differing materially from contract documents.

4-1.02 CHANGES AND EXTRA WORK

Section 4-1.05, "Changes and Extra Work" of the Caltrans Specifications is amended by adding the following between the second and third paragraphs:

"If, in the opinion of the Engineer, such work cannot reasonably be performed concurrently with other items of work, and if a controlling item of work is delayed thereby, an adjustment of contract time will be made."

4-1.08 GREATER VALLEY CONSERVATION CORPS (GVCC) WORK

The City of Stockton has contracted with the local Civilian Conservation Corps, the GVCC, to perform some scope of work associated with the improvements related to this project. This work, outlined in the Drawings, includes:

1. Removal of trees and stumps identified on the Drawings
2. Installation of picnic tables, ADA picnic tables, bicycle racks, trash receptacles, benches, player's benches, group barbecue units, barbecue units, and bleachers. GVCC work includes installation of items only, Contractor shall provide all furnishings identified in the Drawings and these Specifications.
3. Planting of trees identified in the Drawings. GVCC work includes planting of trees only. Contractor shall provide all trees and materials required for planting and shall provide all required maintenance of trees and guarantee all planting in accordance with the Drawings and these Specifications.

The Contractor is responsible for coordinating and scheduling with GVCC and shall provide oversight of work performed by GVCC through its duration.

GVCC Contact for this Project is:

Nicholas Mueller, Director II

Greater Valley Conservation Corps (GVCC)

209-292-2701 (Office)

209-639-5343 (Cell)

nmueller@sicoe.net (Email)

Within (10) ten days of award of Contract, the Contractor shall arrange a coordination meeting with the City, the Landscape Architect and the GVCC to discuss scope and schedule of the various portions of their work.

The Contractor shall include tasks associated with this work by GVCC in the Project Schedule.

4-1.13 CLEANUP

The Contractor's attention is directed to Sections 4-1.13, "Cleanup," of the Caltrans Specifications.

The Contractor shall conduct and cause all working forces at the site to maintain the site in a neat orderly manner throughout the construction operations. The work shall be conducted in a manner that will control the dust. When ordered to provide dust control, the Contractor shall use water to reduce the dusty conditions all to the satisfaction of the Engineer. During construction, the Contractor shall remove all rubbish and debris as it is generated. Upon completion of the work, the Contractor shall remove all equipment, debris, and shall leave the site in a neat, clean condition all to the satisfaction of the Engineer.

SECTION 5 – CONTROL OF WORK

5-1.01 SUBCONTRACTING

The contractor shall **physically attach** the FHWA Form 1273 (revised July 5, 2022, which is included in the Instructions to Bidders) to all contracts, subcontracts, and lower tier subcontracts.

5-1.03 PERMITS

The Contractor's attention is directed to Sections 5-1.20B, "Permits, Licenses, Agreements, and Certifications," of the Caltrans Specifications.

The Contractor shall be responsible for obtaining City, County, State or Federal permits, licenses, certificates, approvals prior to and for the completion of the work. All applicable provisions of OSHA regarding Occupational Safety and Health Administration Code shall be adhered to.

The following is not an all-inclusive list of the required permits and/or licenses, if applicable:

- Contractor's License. A valid California Class A Contractor License.
- Business License. The contractor shall possess, prior to the execution of the contract and maintain throughout the duration of the contract, a valid City of Stockton business license.
- City of Stockton Encroachment Permit
- City of Stockton Building Permits for all structures, buildings and fences
- City of Stockton Demolition Permit
- City of Stockton Tree Removal Permit
- City of Stockton Heritage Oak Permit

- San Joaquin County Environmental Health Approval for pool, pool building and pool fence improvements
- State's Water Resources Control Board Stormwater Construction General Permit (Paid for by Contractor). Notice of Intent (NOI) and Notice of Termination (NOT)
- San Joaquin Valley Air Permit. Contractor is responsible for the preparation and submittal of the San Joaquin Valley Air Pollution Control District Construction Notification Form. For more information visit <http://www.valleyair.org>
- Construction Water – The Contractor is responsible for obtaining a permit for water from California Water Service or City of Stockton, as applicable, for construction water obtained from a City hydrant. This permit shall be approved by the City of Stockton Fire Department.

Full compensation for conforming to the provisions in this section including applicable permit fees, shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore.

5-1.04 SUBMITTALS

The following is a list of anticipated submittals for the project. The list is provided to aid the Contractor in determining the scope of work, but is not intended to be all inclusive and additional submittals may be required:

- List of submittals
- DAS-140
- Shop Drawings
- Material Submittals
- Product submittals
- Emergency Contacts/Authorized Representatives
- Manufacturer's Instructions/Field Reports
- Traffic Control Plan
- Project Schedule (Critical Path Method)
- City of Stockton Construction and Demolition Debris Recycling Report
- City of Stockton Encroachment Permit (if applicable)
- Lead Compliance Plan
- Schedule of Values

The Contractor shall transmit each submittal to the Engineer for review and approval. Submittals shall be sequentially numbered on the submittal list form. Resubmittals shall be identified with the original number and a sequential resubmittal suffix letter. The original submittal shall be numbered X. The first resubmittal shall be numbered X-a and so on. Identify on the form the date of the submittal, and Contractor, Subcontractor or supplier. Any incomplete submittals will be returned for resubmittal.

Schedule submittals to expedite the Project, and deliver to Engineer at the Engineer's office, see Section 10-1.01, "Order of Work," of these Special Provisions.

For each submittal for review, allow 15 calendar days excluding delivery time to and from the Contractor.

When revised for resubmission, identify all changes made since previous submission.

Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

Within 10 calendar days after Notice of Award submit a complete list of all submittals to be submitted and the dates when they will be submitted. **All submittals shall be submitted within 30 calendar days from the date the Notice of Award; otherwise project working days will commence, with or without issuance of the Notice to Proceed.**

Wherever called for in the Contract Documents, or where required by the Engineer, the Contractor shall furnish to the Engineer for review, 1 set, plus one reproducible copy, of each shop drawing submittal. The term "Shop Drawings" as used herein shall be understood to include detail design calculations, shop drawings, fabrication and installation drawings, erection drawings, list, graphs, catalog sheets, data sheets, and similar items. Whenever the Contractor is required to submit design calculations as part of a submittal, such calculations shall bear the signature and seal of an engineer registered in the appropriate branch and in the state of California, unless otherwise directed.

Normally, a separate submittal form shall be used for each specific item or class of material or equipment for which a submittal is required. Transmittal of a submittal of various items using a single form will be permitted only when the items taken together constitute a manufacturer's "package" or are so functionally related that expediency indicates review of the group or package as a whole. A multi-page submittal shall be collated into sets, and each set shall be stapled or bound, as appropriate, prior to transmittal to the Engineer.

Except as may otherwise be indicated herein, the Engineer will return prints of each submittal to the Contractor with their comments noted on the submittal. The Contractor shall make complete and acceptable submittals to the Engineer by the second submission of a submittal item. The City reserves the right to withhold monies due to the Contractor to cover additional costs of the Engineer's review beyond the second submittal.

If a submittal is returned to the Contractor marked "NO EXCEPTIONS TAKEN", formal revision and resubmission of said submittal will not be required.

If a submittal is returned to the Contractor marked "MAKE CORRECTIONS NOTED", formal revision and resubmission of said submittal will not be required.

5-1.05 RECORDS

The Contractor's attention is directed to Sections 5-1.27, "Records," of the Caltrans Specifications.

The cost accounting records for the contract shall be maintained separately from other contracts, during the life of the contract, and for a period of not less than 3 years after the date of acceptance of the contract. If the Contractor intends to file claims against the City, the Contractor shall keep the cost accounting records specified above until complete resolution of all claims has been reached.

Full compensation for conforming to the provisions in this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore.

5-1.06 JOB SITE APPEARANCE

The Contractor shall maintain a neat appearance to the work.

Debris developed during construction shall be disposed of concurrently with its generation. The Contractor shall pay to the City of Stockton the sum of Two Hundred Fifty Dollars (\$250) for every calendar day where debris has remained on the job site overnight.

Full compensation for conforming to the provisions in this section shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

5-1.07 PROPERTY PRESERVATION/EXISTING FACILITIES

The Contractor's attention is directed to Sections 5-1.36, "Property and Facility Preservation," and Section 15, "Existing Facilities," of the Caltrans Specifications.

The Contractor's attention is directed to the existence of certain underground facilities that may require special precautions be taken by the Contractor to protect the health, safety, and welfare of workers and of the public. Facilities requiring special precautions include, but are not limited to, conductors of petroleum products, oxygen, chlorine, and toxic or flammable gases, natural gas in pipelines six (6) inches or greater in diameter, or pipelines operating at pressures greater than 60 psi (gage); underground electric supply system conductors or cables with potential to ground of more than 300 V, either directly buried or in duct or conduit, which do not have concentric grounded or other effectively grounded metal shields or sheaths.

The Contractor shall notify the Engineer and the appropriate regional notification center for operators of subsurface installations at least two (2) working days, prior to performing any excavation or other work close to any underground pipeline, conduit, duct, wire, or other structure. Regional notification centers include, but are not limited to, the following:

Notification Center	Telephone Number
Underground Service Alert – Northern California (USA)	811
	(800) 227-2600

Immediately upon encountering unknown existing facilities, the Contractor shall notify the Engineer in writing of the situation, request coverage of the work as extra work, and aid the Engineer in determining due diligence. Failure to do so may result in forfeiture of any rights to receive extra work compensation under Section 8-1.07, "Delays," of the Caltrans Specifications. Should the Contractor stop work, no compensation will be made for any "down time" prior to written notifications being received by the Engineer or his representative.

Delays due to encountering unexpected facilities shall be determined and compensated in accordance with the provisions of Section 8-1.07, "Delays," of the Caltrans Specifications, and as herein modified. Delays due to encountering unexpected facilities shall be compensated as additional contract working days to the contractor. Contractor shall submit a written request to the Engineer requesting time extension due to the delay. No other compensation is allowed.

Full compensation for conforming to the provisions in this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore.

5-1.08 REQUEST FOR INFORMATION

The Contractor's attention is directed to Sections 5-1.42, "Request for Information" of the Caltrans Specifications.

Contractor shall submit a request for information upon recognition of any event or question of fact arising under the contract. The Engineer shall respond to the request for information within 5 working days.

Full compensation for conforming to the provisions in this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore.

5-1.09 NOTICE OF POTENTIAL CLAIM

The Contractor shall not be entitled to the payment of any additional compensation for any cause, or for the happening of any event, thing or occurrence, including any act or failure to act, by the Engineer, unless he has given the Engineer due written notice of potential claim as herein specified, provided, however, that compliance with this section shall not be a prerequisite for matters within the scope of the protest provisions under "Changes and Extra Work", "Time of Completion" or within the notice provisions in "Liquidated Damages" not to any claim which is based on differences in measurements of errors of computation as to Contract quantities. The written notice of potential claim shall set forth the items and reasons which the Contractor believes to be eligible for additional compensation, the description of work, the nature of the additional costs and the total amount of the potential claim. If based on an act or failure to act by the Engineer, written notice for potential claim must be given to the Engineer prior to the Contractor commencing work; in all other cases, written notice for potential claims must be given to the Engineer within 15 days after the happening of the event, thing or occurrence giving rise to the potential claim.

It is the intention of this Section that potential differences between the parties of this Contract be brought to the attention of the Engineer at the earliest possible time appropriate action may be taken and settlement may be reached. The Contractor hereby agrees that he shall have no right to additional compensation for any claim that may be based on any act or failure by the Engineer or any event, thing or occurrence for which no written notice of potential claim was filed.

5-1.10 INSPECTIONS

All work under this contract shall be under the control and inspection of the City Engineer or his/her appointed representative. The Contractor shall notify the City of Stockton Public Works Department forty-eight (48) hours in advance of any construction. Contractor shall pay for overtime for inspection during City holidays, weekends and non-business hours.

5-1.11 CONSTRUCTION SURVEY

Refer to Section 5-1.26, "Construction Surveys", of the Standard Specifications.

5-1.12 RECORD DRAWINGS

The Contractor shall maintain a complete set of drawings on site for the purpose of keeping up to date all field modifications. This plan set shall be available for review by the project Inspector or the Engineer. These plans shall be provided to the Inspector after the completion of construction at the Post Construction Meeting and prior to the final payment. All revision, modifications and/or changes shall be marked clearly. Notes and dimensions shall be in red and be clear and legible. These plans will be used by the Design Engineer to mark up the original plan sheets with the revisions made during construction.

Full compensation for conforming to the provisions in this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore.

5-1.13 SURFACE RESTORATION

Surface restoration shall consist of restoring all areas within the limits of work to their original existing condition prior to construction.

The Contractor shall restore all paved areas, such as driveways, curb and gutter, roadway surfaces, ditches, landscaped areas, etc., and all other improvements disturbed or damaged by his operations.

Full compensation for conforming to the provisions in this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore.

5-1.14 RIGHTS IN LAND

The following is added to Section 5-1.32, "Areas for Use" of the Caltrans Specifications:

"All work, equipment parking, or any other activity associated with the project shall be confined to the project limits within the street rights-of-way. The Contractor's use of any other property exclusively in connection with this project shall be by a written agreement between the property owner and the Contractor. A certified copy of any such agreement shall be furnished to the Engineer prior to the use of such property by the Contractor."

Full compensation for conforming to the provisions in this section shall be considered as included in prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore.

5-1.15 STAGING AREA

Attention is directed to the requirements specified in Section 5-1.32, "Areas for Use" of the Caltrans Specifications and these Special Provisions.

The street right-of-way shall be used only for activities that are necessary to perform the required work. The Contractor shall not occupy the right-of-way or allow others to occupy the right-of-way for material storage or other purposes that are not necessary to perform the required work.

The Contractor shall secure at his own expense any area required for plant sites, storage of equipment or materials, or for other purposes.

Full compensation for conforming to the provisions in this section shall be considered as included in prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore.

5-1.16 NONCOMPLIANT AND UNAUTHORIZED WORK

Attention is directed to Section 5-1.30, "Noncompliant and Unauthorized Work," of Caltrans Specifications.

SECTION 6 – CONTROL OF MATERIALS

Attention is directed to the provisions in Section 6, "Control of Materials," of the Standard Specifications, and these Special Provisions.

6-1.01 FURNISHED MATERIALS

There are no City Furnished Materials for this project.

6-1.02 TESTING

Testing of materials and work shall conform to the provisions in Section 6, "Control of Materials" of the Caltrans Specifications and these special provisions. Whenever the provisions of Section 6 of the Caltrans Standard Specifications refer to tests or testing, it shall mean tests to assure the quality and to determine the acceptability of the materials and work. Contractor's attention is directed to the City's Quality Assurance Program in Instructions to Bidder Package.

Contractor shall hire a certified, independent from Contractor's company, laboratory to conduct compaction and material testing. A relative compaction of 95% is expected on AC and concrete pavement subgrade.

For asphalt concrete, certificate of compliance, one sieve analysis, and one oil content test per day is required from supplier.

For concrete pavement, curb, gutter, mowbands, play area ramps, play area curbs, and ADA ramps shall have a compressive strength of 3,000 psi at 28 days. Four cylinders per day shall be cast and tested following ASTM C39.

Refer to individual special provisions sections of these specifications for additional materials testing requirements.

Full compensation for conforming to the provisions in this section shall be considered as included in prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore.

6-1.03 MATERIALS AND EQUIPMENT

The Contractor shall furnish all materials and/or equipment needed to complete the work and installations required under the terms of the Contract; exclusive of such materials and/or equipment specifically designated to be furnished and/or installed by the City or under separate Contract.

The Contractor shall submit satisfactory evidence of compliance with the specifications of such materials and/or equipment to be furnished under the Contract and/or to be incorporated in to the work, as the Landscape Architect may require.

Trade Names: Whenever in these Specifications or on the Drawings the name or brand of manufactured article is used it is intended to indicate a measure of quality and utility or a standard.

Both materials and workmanship shall be of best quality manner; all of which shall be subject to the review of the Landscape Architect. Materials shall be new and free from either factory, shop or field applied trade signs or advertising labels exposed to view in the finished work, except only as specified for certain identification work and/or only necessary to identify fire-rated materials or construction.

Substitutions: Within ten (10) days after the "Notice to Proceed," the Contractor shall submit for record and information a complete list of all materials which differ in any respect from materials specified and all materials which are proposed for use in work of this Contract and which are not specifically mentioned in the Specifications.

The Landscape Architect will consider proposals for substitution of materials, equipment and/or methods only when such proposals are accompanied by full and complete technical data and other information required by the Landscape Architect to evaluate the proposed substitution. Proposals submitted without complete data will not be considered. Do not substitute materials, equipment and/or methods unless such substitution has been specifically approved for the work by the Landscape Architect.

Unavailability of Equipment or Materials: Substitution for specified equipment or materials may be proposed by the Contractor if the specified equipment or materials cannot be delivered and incorporated in the work in the time allowed due to conditions beyond the control of the Contractor. Each request for substitution shall include a statement of cause with substantiating documents as proof of quality, delivery time, and

costs in the form of certified quotations from suppliers of both specified and proposed material.

SECTION 7 – LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

7-1.01 PUBLIC CONVENIENCE

Attention is directed to Section 7 “Legal Relations and Responsibility to the Public” of the Caltrans Specifications, Standard Specifications, and these Special Provisions.

The Contractor shall notify San Joaquin Regional Transit District (SJRTD) (dispatcher (209) 948-0642) a minimum of five (5) working days prior beginning Work. Contractor shall coordinate with SJRTD if any bus stops and bus routes are affected.

The Contractor shall inform the City Fire Department, City Police Department, City Traffic Department, Municipal Utilities Department (MUD), Stockton Unified School District, and all affected utilities no later than seventy-two (72) hours before work is to begin. The Contractor shall provide the City with the name and telephone number (business, home, and mobile) of three (3) representatives available at all times during the duration of the contract. Said names and telephone numbers shall be provided to the City of Stockton Public Works, Fire and Police Departments.

The Contractor shall circulate printed form letters, approved by the Engineer, explaining the project to be constructed and the length of time inconvenience will be caused by the project and deliver same to the residents and businesses to be affected at least seventy-two (72) hours before work is to commence. In addition, the Contractor shall provide temporary “No Parking” signs posted seventy-two (72) hours in advance of the work. Such signs shall be placed no further than fifty (50) feet apart. The additional “No-Parking” signs shall be removed on completion of the work and the opening of the street to traffic. The Contractor is responsible for the removal of any vehicles obstructing his operations.

Full compensation for conforming to the provisions in this section shall be considered as included in prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore.

7-1.02 PUBLIC SAFETY

The Contractor’s attention is directed to Section 12-1.02, “Maintaining Traffic” of these Special Provisions. Nothing in the specifications voids the Contractor’s public safety responsibilities.

All safety devices, their maintenance, and use shall conform to the latest requirements of OSHA and shall conform to the applicable provisions of Part 6 "Temporary Traffic Control", latest MUTCD California Supplement, the current edition of the “Manual on Uniform Traffic Control Devices (MUTCD)” and the latest “Work Area Traffic Control Handbook (WATCH)”. It shall be the complete responsibility of the Contractor to protect persons from injury and to avoid property damage.’ Adequate barricades, construction

signs, flashers, and other such safety devices, as required, shall be placed and maintained during the progress of the construction work, until the project is completed. Whenever required, flagmen shall be provided to control traffic.

The Contractor shall provide for the proper routing of vehicles, bicyclists, and pedestrians in a manner that will hold congestion and delay of such traffic to practicable minimum by furnishing, installing, and maintaining all necessary temporary signs, barricades, and other devices and facilities, as approved by the City Traffic Engineer. As the work progresses, the Contractor shall relocate, subject to the City Traffic Engineer's approval, such devices and facilities as necessary to maintain proper routing. The Contractor shall maintain Americans with Disabilities Act (ADA) compliance through the work site (or approved alternate route) at all times during all phases of construction. The Contractor shall notify the City Traffic Engineer via the inspector a minimum of three (3) working days prior to the relocation of any traffic control devices.

Full compensation for furnishing, installing, moving, and removing of all necessary traffic control devices including, but not limited to, signing, striping, barricades, arrow boards, CMS, and flagging shall be included in the contract prices for "Traffic Control" and no additional compensation will be allowed therefore. Section 12-1.04, "Payment," of the Caltrans Specifications is deleted.

7-1.03 LEAD COMPLIANCE PLAN

Attention is directed to Section 7-1.02K(6)(j)(ii) "Lead Compliance Plan, of the Caltrans Specifications.

A lead compliance plan for worker health and safety must be prepared by a Certified Industrial Hygienist (CIH) and must be submitted and implemented prior to the start of construction activities. This plan is needed in order to comply with California Occupational Safety and Health Administration (Cal OSHA) regulations addressing aurally deposited lead for projects involving soil disturbance, and to minimize worker exposure to lead chromate or lead while handling paint and thermoplastic residue.

Allow 7 days for the Engineer's review. Obtain authorization for the plan before starting any activity that presents the potential for lead exposure.

The plan shall include items listed in 8 CA of Regs § 1532.1(e)(2)(B). Obtain authorization for the plan before starting any activity that presents the potential for lead exposure. Contractor shall provide a safety training program to employees who have no prior training, including City employees. The safety training program shall comply with 8 CA Code of Regs § 1532.1 and the provided lead compliance plan. Contractor shall submit copies of air monitoring or job site inspection reports made by or under the direction of the CIH under 8 CA Code of Regs § 1532.1 within 10 days after the date of monitoring or inspection.

Supply personal protective equipment, training, and washing facilities required by your lead compliance plan for five City employees.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore.

SECTION 8 – PROSECUTION AND PROGRESS

Attention is directed to the provisions in Section 8 of the Standard Specifications, and these Special Provisions.

8-1.01 TIME OF COMPLETION

Attention is directed to the provisions in Sections 8-1.05, "Time", and 8-1.07, "Delay" of the Standard Specifications, and these Special Provisions.

The contract for the performance of the work and the furnishing of materials shall be executed within ten (10) days after the approval thereof by the City Attorney. The City will issue the Notice to Proceed following execution of the contract.

Submittals shall be delivered to the Engineer within thirty (30) calendar days of execution of contract. Contract shall not start any work on the job site until the Engineer approves the submittals. Refer to section 5-1.05, "Submittals" of these Special Provisions. The Contractor shall only enter the jobsite prior to approval of the above submittals for purposes of measuring field dimensions and locating utilities.

The Contractor shall diligently prosecute the contract work to completion within 250 working days. The days to finish the punch list, provided by the City, are included in the Original Working Days.

Notice to Proceed will not be issued until all complete submittals have been reviewed at least once. Correction indicated on submittals shall be considered as changes necessary to meet the requirements of the Contract Documents and shall not be taken as the basis for changes to the contract requirements. The Engineer's review of Contractor Shop Drawing submittals shall not relieve the contractor of the entire responsibility for the correctness of details and dimensions. The Contractor shall assume all responsibility and risk for any misfits due to error in Contractor submittals. The Contractor shall be responsible for the dimension and the design of adequate connections and details.

Prior to Notice to Proceed, the Contractor shall indicate in writing when all electrical hardware and equipment, which makes the project electrical and lighting systems operational, will be delivered to the project site. Based on the indicated delivery date, the date to commence the work will be issued by the City. If by any unforeseen action, the established delivery date cannot be made, the Contractor shall provide the City with a letter from the manufacturer indicating the reason why the delivery date cannot be met. The letter shall also indicate the revised delivery date. The City reserves the right to either accept the reason or to reject it. A letter from vendor is not acceptable.

Should the Contractor choose to work on a Saturday, Sunday, or on a holiday recognized by the labor unions, the Contractor shall reimburse the City of Stockton the actual cost of engineering, inspection, testing, superintendent, and/or other overhead expenses, which are directly chargeable to the contract. Should such work be undertaken at the request of the City, reimbursement will not be required.

8-1.02 LIQUIDATED DAMAGES

Attention is directed to the provisions in Section 8-1.10, "Liquidated Damages," of the Caltrans Specifications and these Special Provisions.

The Contractor shall pay liquidated damages to the City of Stockton in the amount of **\$10,000 (TEN THOUSAND DOLLARS)** per day for each and every calendar day that the work, with the exception of the plant establishment and maintenance period, remains incomplete after expiration of the contract working days specified in these Special Provisions.

Full compensation for conforming to the provisions in this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore.

8-1.03 PROGRESS SCHEDULE

Comply with Section 8-1.02, "Schedule," of the Caltrans Specifications, except you must:

1. Use computer software to prepare the schedule
2. Furnish compatible software for the Engineer's exclusive possession and use

The Contractor is responsible for assuring that all activity sequences are logical and that each schedule shows a coordinated plan for complete performance of the work.

DEFINITIONS

contract completion date: The current extended date for completion of the contract shown on the weekly statement of working days furnished by the Engineer as specified in Section 8-1.05, "Time," of the Caltrans Specifications.

data date: The day after the date through which a schedule is current. Everything occurring earlier than the data date is "as-built" and everything on or after the data date is "planned."

float: The difference between the earliest and latest allowable start or finish times for an activity.

milestone: An event activity that has zero duration and is typically used to represent the beginning or end of a certain stage of the project.

near critical path: A chain of activities with total float exceeding that of the critical path but having no more than 10 working days of total float.

time-scaled network diagram: A graphic depiction of a Critical Path Method (CPM) schedule comprised of activity bars with relationships for each activity represented by arrows. The tail of each arrow connects to the activity bar for the predecessor and points to the successor.

total float: The amount of time that an activity or chain of activities can be delayed before extending the scheduled completion date.

SUBMITTALS

General Requirements

Submit to the Engineer baseline, monthly updated, and final updated schedules, each consistent in all respects with the time and order of work requirements of the contract. Perform work in the sequence indicated on the current accepted schedule.

Each schedule must show:

1. Calculations using critical path method to determine controlling activities.
2. Duration activities less than 20 working days.
3. Each required constraint. Constraints other than those required by the special provisions may be included only if authorized.

The Engineer's review and acceptance of schedules does not waive any contract requirements and does not relieve the Contractor of any obligation or responsibility for submitting complete and accurate information. Correct rejected schedules and resubmit them within 7 days of notification by the Engineer, at which time a new review period of 7 days will begin.

Errors or omissions on schedules do not relieve the Contractor from finishing all work within the time limit specified for completion of the contract. If, after a schedule has been accepted by the Engineer, either you or the Engineer discovers that any aspect of the schedule has an error or omission, the Contractor must correct it on the next updated schedule.

Baseline Schedule

Submit to the Engineer a baseline schedule within 20 days of approval of the contract. Allow 20 days for the Engineer's review after the baseline schedule and all support data are submitted. Beginning the week the baseline schedule is first submitted, meet with the Engineer weekly to discuss and resolve schedule issues until the baseline schedule is accepted. The baseline schedule must include the entire scope of work and must show how the Contractor is plans to complete all work contemplated. Multiple critical paths and near-critical paths must be kept to a minimum. A total of not more than 50 percent of the baseline schedule activities must be critical or near critical, unless otherwise authorized by the Engineer. The baseline schedule must not extend beyond the number of working days originally provided in these special provisions.

Updated Schedule

Submit an updated schedule and meet with the Engineer to review contract progress on or before the 1st day of each month, beginning one month after the baseline schedule is accepted. Allow 15 days for the Engineer's review after the updated schedule and all support data are submitted, except that the review period will not start until any previous month's required schedule is accepted. Updated schedules that are not accepted or rejected within the review period are considered accepted by the Engineer.

The updated schedule must show:

1. Data date of the 21st day of the month or other date established by the Engineer

2. Changes from approved revised schedules

Final Updated Schedule

Submit a final updated schedule with actual start and finish dates for the activities within 30 days after completion of contract work. Provide a written certificate with this submittal signed by the Contractor's project manager or an officer of the company stating, "To my knowledge and belief, the enclosed final updated schedule reflects the actual start and finish dates of the actual activities for the project contained herein." An officer of the company may delegate in writing the authority to sign the certificate to a responsible manager.

Full compensation for conforming to the provisions in this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore.

8-1.04 PRE-CONSTRUCTION CONFERENCE

The City of Stockton Public Works Department will schedule a pre-construction meeting with the Contractor following award of the contract and prior to commencing work (Ivan Reynoso, (209) 937-7390). This meeting will be held in the City of Stockton, Public Works Department.

Full compensation for conforming to the provisions in this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore.

8-1.05 POST CONSTRUCTION CONFERENCE

The Contractor shall attend a post-construction meeting that will be arranged by the Public Works Department (Ivan Reynoso, (209) 937-7390) after completion of work and prior to acceptance and final payment. The project engineer and the project Inspector will also attend this meeting. The purpose of the meeting will be to discuss the project and any related issues that can help improve future Public Works construction projects. This meeting will be held in the City of Stockton, Public Works Department.

At this meeting the Contractor will also submit a marked-up set of record drawings/as-built plans at no additional cost to the City.

Full compensation for conforming to the provisions in this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore.

8-1.06 PROJECT CLOSEOUT

This Section specifies administrative and procedural requirements for project closeout, including but not limited to:

1. Review procedures.
2. Project record document submittal.
3. Operating and maintenance manual submittal.

4. Submittal of warranties.
5. Final cleaning.
6. Play equipment inspection letter
7. Landscape Certification letter

Closeout requirements for specific construction activities are included in the appropriate Specification Sections.

SUBSTANTIAL COMPLETION/BEGINNING OF MAINTENANCE PERIOD

Preliminary Procedures: Before requesting review for certification of Substantial Completion, complete the following. List exceptions in the request.

1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
 - a. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
2. Advise City of pending insurance change-over requirements.
3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
4. Submit record drawings, maintenance manuals, final project photographs, damage or settlement survey, property survey, and similar final record information.
5. Submit lock count for any padlock changeovers and/or for any items which will be required to be locked; submit core count for replacement of any non-City keyed cores in facilities requiring City keyed cores. Advise the City's personnel of change-over in security provisions.
6. Complete start-up testing of systems prior to substantial completion, and coordinate an instructional meeting between the City maintenance staff and the irrigation pump manufacturer and provide or coordinate training for any applicable systems (see Close-Out Procedures in Section 3.1).
7. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements. Construction fence should remain in place until Certificate of Final Acceptance is received.
8. Verify specific requirements have been met per Landscape Maintenance – Section 32 01 90

Review Procedures: Contractor shall request a review for Substantial Completion two weeks prior to the desired date. On receipt of a written request for substantial completion review, the City Inspector will either proceed with scheduling the review or advise the Contractor of unfilled requirements which must be completed prior to the

review. The City Inspector will prepare the Certificate of Substantial Completion following review, or advise the Contractor, in writing by providing a punch-list of construction that must be completed or corrected before the certificate will be issued.

1. The City Inspector will repeat review when requested and assured that the Work has been substantially completed.
2. Results of the completed review will form the basis of requirements for final acceptance.

After 90 days of maintenance, the contractor shall call for an on-site meeting with the City, park planner, and City maintenance to review City operations. For the last 30 days of maintenance, the contractor shall maintain the park using the City's irrigation schedule, mowing schedule, and maintenance program.

1. Program the irrigation controller to provide a 5-day watering schedule with a watering window of 10pm through 6am starting Sunday night and ending Friday morning using the table as provided on the project plans.

Final Acceptance: Preliminary Procedures: Before requesting final review for certification of final acceptance and final payment, complete the following. List exceptions in the request.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
3. Submit a certified copy of the City Inspector's final review punch-list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance and the list has been endorsed and dated by the City Inspector.
4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion, or when the City took possession of and responsibility for corresponding elements of the Work.
5. Submit consent of surety to final payment.
6. Submit a final liquidated damages settlement statement.
7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
8. Make final change-over of permanent locks and transmit keys to the City.
9. Deliver tools, spare parts, extra stock, and similar items.
10. Obtain and submit releases enabling the City unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.

11. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.

Re-Review Procedure: The City Inspector will re-review the Work upon receipt of notice that the Work, including review punch-list items from earlier reviews, has been completed, except items whose completion has been delayed because of circumstances acceptable to the City Inspector.

1. Upon completion of re-review, the City Inspector will prepare a Certificate of Final Acceptance, or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
2. If necessary, re-review will be repeated.

RECORD DOCUMENT SUBMITTALS

General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Landscape Architect's reference during normal working hours.

Record Drawings: Maintain a clean, undamaged set of black line white-prints of the signed Contract Drawings and Shop Drawings. Mark the set to show the actual installation including dimensions where the installation varies substantially from the work as originally shown. Mark whichever sheet is most capable of showing conditions fully and accurately; where shop drawings are used, record a cross-reference at the corresponding location on the contract drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the work.
2. Mark new information that is important to the owner, but was not shown on the contract drawings or shop drawings.
3. Note related change order numbers where applicable.
4. Incorporate shop drawings and contract drawings onto one set titled "Record Drawings". Shop drawings shall be arranged onto 24x36 sheets, each identified and cross-referenced to the appropriate plan sheet.
5. Mylars and a .PDF scan on CD of the record drawings set shall be given to the City at completion of the project.

The Record Drawings shall be updated on a weekly basis and submitted complete to the City with each pay request. Pay requests will not be processed without the aforementioned Record Drawings. Note related change orders on the drawings where applicable.

Upon completion of the work, it shall be the responsibility of the Contractor to transfer all revisions to a complete set of reproducible mylars, which will be furnished by the Landscape Architect and paid for by the City. The Contractor shall submit the reproducible Record Drawings to the City with request for final payment. Final payment will not be processed without the aforementioned Record Drawings.

Record Specifications: Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data.

1. Upon completion of the Work, submit record Specifications to the Landscape Architect for the City's records.

Record Product Data: Maintain one copy of each Product Data submittal. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark-up of record drawings and Specifications.

1. Upon completion of mark-up, submit complete set of record Product Data to the Landscape Architect for the City's records.

Record Sample Submitted: Immediately prior to the date or dates of Substantial Completion, the Contractor will meet at the site with the Landscape Architect and the City's personnel to determine which of the submitted Samples that have been maintained during progress of the Work are to be transmitted to the City for record purposes. Comply with delivery to the City's Sample storage area.

Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Landscape Architect for the City's records.

Maintenance Manuals: Organize operating and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual heavy-duty 2-inch, 3-ring vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:

1. Emergency instructions.
2. Spare parts list.
3. Copies of warranties.
4. Wiring diagrams.
5. Recommended "turn around" cycles.
6. Inspection procedures.
7. Shop Drawings and Product Data.

8. Fixture lamping schedule.

GUARANTEES

The Contractor shall guarantee that the work done under the Contract will be free from faulty materials or workmanship and shall agree that immediately upon receiving notification from the City Engineer to remedy, repair, or replace without cost to the City and to the entire satisfaction of the City, all defects, damages or imperfections appearing in the work within a period of one (1) year after the date of Final Acceptance has been recorded for the work done under the Contract provided, however, that should the Drawings and/or Specifications provide for any warranty or guarantee of any materials or workmanship in excess of the aforesaid one (1) year period then such warranty or guarantee shall be controlling as to the materials or workmanship covered thereby. Neither payments to the Contractor nor total or partial occupancy of work by the City or persons operating under contract with the City shall relieve the Contractor of these obligations.

Subcontractor: The Contractor shall obtain and submit in duplicate, guarantees and warranties from those subcontractors, material men, and manufacturers, as specified in the Contract Documents. Such guarantees and warranties shall be submitted on the guarantor's own letterheads.

Should defects develop in the work under the Contract within the specified period of any guarantee or warranty, due to faults in materials or workmanship, the Contractor shall arrange for the correction of such defective work together with any other work damaged or otherwise affected thereby, all without any additional cost to the City and within ten (10) calendar days after written notice to the Contractor by the City.

In the event the Contractor fails to correct defective work and/or materials when so ordered, the City may have the work done and charge the cost thereof against payments due or to become due to the Contractor. If no such payments are available, the Contractor and his sureties shall pay the City.

All guarantees or warranties shall commence only after all work has been completed and Notice of Completion has been filed by the City, regardless of whether or not the City or any persons operating under the Contract with the City has partially or wholly occupied any portion of the work.

CLOSEOUT PROCEDURES

Operating and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance to meet with the City's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. At the time of substantial completion and instruction, include a detailed review of the following items:

1. Maintenance manuals.
2. Record documents.
3. Spare parts and materials.
4. Tools.
5. Lubricants

7. Identification systems.
8. Control sequences.
9. Hazards.
10. Cleaning.
11. Warranties and bonds.
12. Maintenance agreements and similar continuing commitments.

As part of instruction for operating equipment, demonstrate the following procedures:

1. Start-up.
2. Shutdown.
3. Emergency operations.
4. Noise and vibration adjustments.
5. Safety procedures.
6. Economy and efficiency adjustments.
7. Effective energy utilization.

Final review and final equipment and appurtenance adjustments after initial break in: see Landscape Maintenance – Section 32 01 90 of these Specifications.

FINAL CLEANING

General: General cleaning during construction is required by the General Conditions and included in Section "Temporary Facilities".

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

1. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.
 - a. Remove labels that are not permanent labels.
 - b. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
 - c. Clean exposed hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.
 - d. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
 - e. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom

clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

Pest Control: Engage an experienced exterminator to make a final inspection, and rid the Project of rodents, insects and other pests.

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

Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the City's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.

1. Where extra materials of value remaining after completion of associated Work have become the City's property, arrange for disposition of these materials as directed.

SECTION 9 – PAYMENT

9-1.01 GENERAL

All measurements and payments for this work shall conform to all applicable provisions on Section 9, "Measurement and Payment" of the Standard Specifications, Instructions to Bidders, and these special provisions.

The contract lump sum price paid for each lump sum bid item shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in each of the items, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer. Items not specifically listed but necessary for a full and complete installation of the work (e.g. administration/overhead, mobilization, construction staking, erosion and sediment control, etc.) shall be considered incidental to the items listed and no separate payment for such items shall be made. The Engineer's determination of what items are to be included in the category of "necessary for a full and complete installation of the work" shall be final.

The contract unit price paid for all work items shown on Supplemental Unit Price Bid Table shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in each of the items shown on the plan, as specified in the Standard Specifications and these Special Provisions, and as directed by the Landscape Architect. Items not specifically listed in the Supplemental Unit Price Bid Table but necessary for a full and complete installation of the work (e.g. mobilization, construction staking, erosion and sediment control, etc.) shall be considered incidental to the items listed in the Supplemental Unit Price Bid Table and no separate payment for such items shall be made. The Landscape Architect's

determination of what items are to be included in the category of “necessary for a full and complete installation of the work” shall be final.

No partial payment will be made for any materials that are furnished on hand, but not yet installed or incorporated in the work. The work to be performed consists of furnishing all labor, materials, tools, transportation, supplies, equipment, appurtenances, fuel, and power, unless specifically excepted, necessary, or required to complete the work in conformity with the Contract Documents, as further delineated on the plans and described in these Special Provisions.

All other work as may be necessary as indicated on the plans, in the specifications, and as required by the Engineer.

Upon completion of all of the work included herein, including approved contract change orders as appropriate, the Contractor may request that the Engineer file a Notice of Completion for the purposes of relief of maintenance and release of retention.

All materials designated to be removed shall become the property of the Contractor, unless otherwise noted, and shall be disposed in accordance with local, State, and Federal laws and ordinances.

Full compensation for disposal of materials and performing the work in these Special Provisions shall be included in the lump sum price bid, and no additional compensation will be allowed therefore.

Attention is directed to Section 9 of the Standard Specifications, Section 9, “Payment,” of the Caltrans Specifications, and these Special Provisions. All payments for this work shall conform to all applicable provisions on Section 9 of the Caltrans Specifications.

All materials designated to be removed shall become the property of the Contractor, unless otherwise noted, and shall be disposed in accordance with local, state, and federal laws and ordinances.

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9-1.02 PAYMENTS

Attention is directed to Sections 9-1.16, "Progress Payments," and 9-1.17, "Payment After Contract Acceptance," of the Caltrans Specifications, and Sections 9-1.16A, "Progress Payments - General," and 9-1.17D, "Final Payment and Claims," of the Standard Specifications. No partial payment will be made for any materials that are furnished on hand, but not yet installed or incorporated in the work.

Full compensation for all labor, equipment, tools, materials, services, travel, and incidentals and for doing all the work and all other items required to complete the work in conformity with the Contract Documents will be included in the lump sum bid and no additional work compensation will be allowed therefore. No other compensation will be made except for the items listed in the Bid Proposal. Work for which no separate payment has been provided will be considered as a subsidiary obligation of the Contract.

9-1.03 INCREASE OR DECREASE QUANTITIES

The City reserves the right to make such alterations, deviations, additions to, or omissions from the plans and specifications, including the right to increase or decrease the quantity of any item or portion of the work or to omit any item or portion of the work, as may be deemed by the Engineer to be necessary or advisable and to require such extra work as may be determined by the Engineer to be required for the proper completion or construction of the whole work contemplated, without adjustment in the unit price as bid. Section 9-1.06B and Section 9-1.06C of the Caltrans Specifications shall not apply.

Any such changes will be set forth in a contract change order, which will specify, in addition to the work to be done in connection with the change made, adjustment of contract time, if any, and the basis of compensation for such work. A contract change order will not become effective until approved by the Public Works Director. City Manager and/or City Council approval may be necessary depending on the amount of the change order.

9-1.04 SCHEDULE OF VALUES

Submit a schedule of values within 15 days after Contract approval. Value schedules for each lump sum bid item shall be prepared and submitted to the Engineer as set forth in Section 9-1, "Lump Sum Contracts", of the Standard Specifications and Section 9-1.16B, "Schedule of Values," of the Caltrans Specifications. Unless otherwise approved by the Engineer, materials on hand, but not incorporated into the work, shall not be included for measurement or for purposes of payment.

The schedule of values shall include a breakdown of the Contract corresponding with payment request breakdown and progress schedule line items for this project. Submit schedule of values in duplicate within ten (10) days after Notice to Proceed. Schedule shall be approved by the City Representative prior to submitting the first application for payment.

The Contractor shall establish the value of project submittals as one percent (1%) of the total project value.

The Contractor shall establish a value for the maintenance periods of plantings and turf. Identify the maintenance periods of plantings and turf as a separate item.

Format: Utilize the Table of Contents of these Special Provisions. Identify each line item with number and title of the major specification section. Identify the items listed in the Supplemental Unit Price Bid Table in the Bidding Schedule as individual pay items under their corresponding specification section. Identify site mobilization, bonds and insurance. Identify shop drawings and submittals as a pay item.

Include in each line item, a directly proportional amount of Contractor's overhead and profit.

The aggregate total of all items shall equal the contract sum.

Compensation amount for each item shall be approved by the City.

Revise schedule to list approved Change Orders, with each Application for Payment.

9-1.05 DESCRIPTION OF WORK

The work herein to be performed by the Contractor consists of constructing and completing the "Project," as defined in the General Conditions, Special Provisions and Requirements, in accordance with the Drawings and Specifications and all applicable provisions of the Contract Documents and the City of Stockton Standard Specifications. It is intended that these plans and the City of Stockton Standard Specifications and these Special Provisions require all labor and materials necessary for the work contemplated. The Contractor shall notify the City immediately regarding any discrepancies or ambiguities which may exist in the Plans, Specifications and Special Provisions. The City's interpretation or correction thereof shall be conclusive.

The "Project" shall generally consists of renovation of an existing park and swimming Pool, including: new pool building, pool equipment, pool area fencing and various other pool related improvements, parking lot improvements, new picnic shelters, new ballfield, new play area, new restroom, basketball courts, futsal court, renovated soccer fields, walkway replacement and new concrete walkways, landscaping and irrigation system modification, path lighting as described in the Plans and Specifications entitled, "McKinley Park and Pool Renovation", Stockton, CA. City of Stockton Project Number WR21017.

General Construction Informational Signs: At least two day in advance of any construction activity, the Contractor shall install a project information construction sign(s) 24" by 48" in size (minimum) with 2" minimum height letters, at the site where construction work is occurring. Letters shall be black on white background. Location of the sign(s) shall be determined by the Landscape Architect. All materials used shall be durable and resistant to the elements (including weather conditions) and graffiti. Proof of sign and description of materials and construction of sign must be submitted to City for approval prior to printing and fabrication. Compensation for this item shall be included in the base bid. Information on the sign shall include the name of the Contractor, the general project description and a twenty-four hour telephone number for the contractor.

Prop 68 Informational Signs: At least two day in advance of any construction activity, the Contractor shall install a Prop 68 project information sign per the plans. Sign shall include 1" minimum height letters. Letters shall be black on white background. Location of the sign(s) shall be determined by the Landscape Architect. Compensation for this item shall be included in the base bid. The sign must display the Parks and Water Bond Act logo (<https://resources.ca.gov/grants/Grant-Program-Resources>, click on the logo artwork section.) and display the logo to maximize visibility and durability. The logo must be a minimum of 24" x 24". The signs must contain the following language:

Gavin Newsom, Governor

Wade Crowfoot, Secretary for Natural Resources

Armando Quintero, Director, California Department of Parks and Recreation

All materials used shall be durable and resistant to the elements (including weather

conditions) and graffiti. The sign must be available during construction, at the final inspection of the project, and remain in place for a minimum of four (4) years from date of project completion. Proof of sign and description of materials and construction of sign must be submitted to City for approval prior to printing and fabrication.

The "Work" as described in these specifications shall generally consist of all work specified, indicated, shown or contemplated in the contract to construct the improvements. Contractor shall order and furnish all labor, materials, supplies, tools, mobilization and transportation and perform all operations in connection with and reasonably incidental to complete the work.

The Project Includes two alternate lump sum bid items:

DEDUCT ALTERNATE #1: Includes a reduction of scope at the East 8th Street Parking Lot involving isolated spot repair of portions of parking lot asphalt paving, an overlayment of 2-coats of slurry seal over the entire parking lot. A credit for more extensive pavement and curb replacement included as part of the base bid improvements shall be provided.

ADD ALTERNATE #1: Includes replacement of overhead electrical surface with new underground service, new meter/ main panel at existing storage building.

SUPPLEMENTAL UNIT PRICE DESCRIPTION

Supplemental unit prices for items listed in the table of Supplemental Unit Prices shall be based on these items complete in place including the costs of all labor, material, overhead and all other incidental or appurtenant costs as shown on the Drawings and specified in the Special Provisions. Should certain additional work be required, or should the quantities of certain classes of work be increased or decreased from those of which the contract sum is based, by order or approval of the City, the Contractor agrees that the following supplemental unit prices may be used as the basis of payment to him or credit to the City for such addition, increase or decrease in the work as determined solely by the City.

Performance of work which is not required under the Contract Documents or which is not authorized by Change Order, whether or not such work item is set forth hereunder as a Unit Price item, shall not be considered cause for any extra payment. The Contractor will be held fully responsible for such unauthorized work, including the performance of all corrective measures required by the City, the City's Representative or the Landscape Architect.

1. Supplemental Unit Prices for Removal of Trees and Tree Stumps, Removal of Trees and Tree Stumps shall include full compensation for complete removal and proper disposal of the items as indicated on the drawings, specified in these Special Provisions and as directed by the City
2. Supplemental Unit Prices for Removal of Pavements and Base, Removal of Asphalt Pavement and Aggregate Base, Removal of Concrete and Asphalt Pavement, Removal of Infield Mix, Removal of Asphalt Concrete (4" AC) shall

include full compensation for complete removal and proper disposal of the items as indicated on the drawings including sawcutting and removal of pavement, aggregate base and reinforcing, specified in these Special Provisions and as directed by the City

3. Supplemental Unit Price for 2" Asphalt Grind, 2" Asphalt Grind shall include full compensation for grinding pavement and proper disposal of the ground pavement as indicated on the drawings including pavement, aggregate base and reinforcing, specified in these Special Provisions and as directed by the City
4. Supplemental Unit Price for Removal of Concrete Curb, Removal of Concrete Curb shall include full compensation for complete removal and proper disposal of the items as indicated on the drawings including sawcutting, removal of concrete base and reinforcing, specified in these Special Provisions and as directed by the City
5. Supplemental Unit Prices for Removal of 5ft Chain Link Fence, Removal of 8ft Chain Link Fence and Removal of 12ft Chain Link Fence shall include full compensation for complete removal and proper disposal of the items as indicated on the drawings including fence posts, footings, fabric, rails and hardware as specified in these Special Provisions and as directed by the City
6. Supplemental Unit Prices for Removal of 2" Domestic Water Line and Removal of 6" Sewer Line shall include full compensation for complete removal and proper disposal of the items as indicated on the drawings including trenching, cutting and removal of pipe and capping of piping to remain as specified in these Special Provisions and as directed by the City
7. Supplemental Unit Price for Clearing and Grubbing, Clearing and grubbing shall include full compensation for complete removal and proper disposal of the items as indicated on the drawings as specified in these Special Provisions and as directed by the City
8. Supplemental Unit Prices for Removal of Utility Pole and Streetlight and Removal of Sports Light Poles (at Soccer Field) shall include full compensation for complete removal and proper disposal of the items as indicated on the drawings including disconnection of power, removal of pole, footings, and light fixture as specified in these Special Provisions and as directed by the City
9. Supplemental Unit Price for Removal of Overhead Streetlight Conductors, shall include full compensation for complete removal and proper disposal of the items as indicated on the drawings including disconnection of power, removal of conductors as specified in these Special Provisions and as directed by the City
10. Supplemental Unit Price for Aggregate Base – Class II shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the aggregate base – class II, complete in place, including excavation, subgrade preparation and compaction to the depths indicated on the drawings, specified in these Special Provisions and as directed by the City.
11. Supplemental Unit Prices for Slurry Seal, 2" Asphalt Overlay and Asphalt - Parking Lot shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the items, complete in place, including

excavation, subgrade preparation, aggregate base, and compaction, as indicated on the drawings, specified in these Special Provisions and as directed by the City.

12. Supplemental Unit Prices for Truncated Domes shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the Truncated Domes, complete in place, as indicated on the drawings, specified in these Special Provisions and as directed by the City.
13. Supplemental Unit Prices for 6" Vertical Curb, 6" Vertical Curb and Gutter, 9" Mowband, 12" Mowband, and Play Area Curb shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the items, complete in place, including trenching and backfilling, subgrade preparation, forms, reinforcement, concrete, finishing, aggregate base, and compaction, as indicated on the drawings, specified in these Special Provisions and as directed by the City.
14. Supplemental Unit Prices for Sanitary Sewer Cleanout shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the items, complete in place, including trenching and backfilling, piping, fittings and assembly appurtenant to its construction, as indicated on the drawings, specified in these Special Provisions and as directed by the City.
15. Supplemental Unit Prices for 1-1/4" Gas Service Line, Sanitary Sewer Line – 4" and Domestic Water Line – 2" shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the items, complete in place, including trenching and backfilling, bedding, piping, risers, welding, sanitizing, testing and inspections as indicated on the drawings, specified in these Special Provisions and as directed by the City.
16. Supplemental Unit Prices for Pedestrian Concrete Pavement and Vehicular Concrete Pavement shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the material, complete in place, including subgrade preparation, formwork, aggregate base and reinforcement, as indicated on the drawings, specified in these Special Provisions and as directed by the City.
17. Supplemental Unit Prices for Play Area Ramp shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the material, complete in place, including subgrade preparation, formwork, aggregate base and reinforcement, as indicated on the drawings, specified in these Special Provisions and as directed by the City.
18. Supplemental Unit Prices for Control Low Strength Material (CLSM) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for CLSM fill, including forms, all grading necessary for installation of forms, to finished grade, disposal of all excess material, all sawcuts, trenching, and boring, where required, grading under fill, providing and grading aggregate base subbase, backfill, compaction, watering, concretes and curing compound, and for doing all the work involved in furnishing and placing controlled low density fill materials in place, as shown on the plans, as specified these Special Provisions, and as directed by the Engineer shall be included in the prices paid

for the contract items of work involved, and no additional work compensation will be allowed therefor.

19. Supplemental Unit Prices for Play Area Wood Fiber shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the material, complete in place, to the specified depth, as indicated on the drawings, specified in these Special Provisions and as directed by the City.
20. Supplemental Unit Prices for Prefabricated Restroom Building shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the building, designed, fabricated, delivered, and installed in place including all utility connection to stubs and subgrade and base preparation, as indicated on the drawings, specified in these Special Provisions and as directed by the City.
21. Supplemental Unit Prices for LED Pathway Fixture, LED Surface Mounted Light Fixture, LED Basketball Court Fixture, LED Flood Light and LED Street Light, shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the items, complete in place, including concrete footings, bolts, brackets, pole, fixture, inspections and testing, and assembly appurtenant to its construction, as indicated on the drawings, specified in these Special Provisions and as directed by the City.
22. Supplemental Unit Prices for Service Pedestal shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the pedestal, designed, fabricated, delivered, and installed in place including electrical connection, concrete pad and base preparation, as indicated on the drawings, specified in these Special Provisions and as directed by the City.
23. Supplemental Unit Prices for 2" Conduit with Conductors shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the items, complete in place, including trenching and backfilling, bedding, conductors, conduit, testing and inspections as indicated on the drawings, specified in these Special Provisions and as directed by the City.
24. Supplemental Unit Prices for Landscape Maintenance and Turf Maintenance Treatment shall include full compensation for furnishing all labor, tools, equipment and incidentals for providing the Landscape Maintenance and Turf Maintenance Treatment scope, including amendments, topdressing soil, seed, watering, thatching, aerating, topdressing to the specified depth,, and overseeding complete in place, as indicated on the drawings, specified in these Special Provisions and as directed by the City.
25. Supplemental Unit Prices for Decomposed Granite Pavement and Infield Mix shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the items, complete in place, including excavation, subgrade preparation, aggregate base, stabilizer, and compaction, as indicated on the drawings, specified in these Special Provisions and as directed by the City.
26. Supplemental Unit Prices for Sports Court Pavement and Sports Court Surfacing over Existing Pavement shall include full compensation for furnishing all

materials, labor, tools, equipment and incidentals for furnishing the material, complete in place, including subgrade preparation, aggregate base, concrete pavement, reinforcement, asphalt concrete, slip sheet system, surfacing system, and striping as indicated on the drawings, specified in these Special Provisions and as directed by the City.

27. Supplemental Unit Prices for 5-ft Height Chain Link Fence, 5-ft Height Chain Link Rails, Fabric and Fittings, 6-ft Height Chain Link Fence, 6-ft Height Chain Link Rails, Fabric and Fittings, 8-ft Height Chain Link Fence, 8-ft Height Chain Link Rails, Fabric and Fittings, 12-ft Height Chain Link Fence, 12-ft Height Chain Link Rails, Fabric and Fittings, Play Area Fence At Play Area Curb, Pool Area Fence shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the items, complete in place, including concrete footings, concrete mowband, concrete curb, and all fabric, rails, posts, fittings, and connection hardware and assembly appurtenant to its construction, as indicated on the drawings, specified in these Special Provisions and as directed by the City.
28. Supplemental Unit Prices for Sports Court Gate, Dugout Area Fence Gate, Pool Area Gate shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the items, complete in place, including concrete footings, concrete mowband, concrete curb, and all fabric, rails, posts, fittings, panic bars, handles, hinges, hardware and assembly appurtenant to its construction, as indicated on the drawings, specified in these Special Provisions and as directed by the City.
29. Supplemental Unit Prices for Bench, Picnic Table, Bicycle Rack, Barbeque Unit, Group Barbeque Unit, Basketball Goal, Removable Bollard, Trash Receptacle, Bat Rack shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the items, complete in place, including concrete footings, finishes, fittings, and assembly appurtenant to its construction, as indicated on the drawings, specified in these Special Provisions and as directed by the City.
30. Supplemental Unit Prices for Player's Bench, Backstop, Bleacher, shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the items, complete in place, including concrete footings, finishes, fittings, and assembly appurtenant to its construction, as indicated on the drawings, specified in these Special Provisions and as directed by the City.
31. Supplemental Unit Prices for Storm Drain Pipe - 12" and Trench Drain shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the items, complete in place, including trenching and backfilling and bedding as indicated on the drawings, specified in these Special Provisions and as directed by the City.
32. Supplemental Unit Prices for 24" Catch Basin, Play Area Drain and Maintenance Hole (SDMH) shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the items, complete in place, including trenching and backfilling, concrete footings, frames, gratings and covers and

assembly appurtenant to their construction, as indicated on the drawings, specified in these Special Provisions and as directed by the City.

33. Supplemental Unit Prices for Cobble Stone Rock Blanket (4"-6" Round) shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the items, complete in place, including excavation, subgrade preparation, and filter fabric as indicated on the drawings, specified in these Special Provisions and as directed by the City.
34. Supplemental Unit Prices for Shrub Rotary Assembly and Turf Rotor Assembly shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the items, complete in place, including trenching and backfill, lateral line, all fittings, connection hardware, nozzels and swing joints, as indicated on the drawings, specified in these Special Provisions and as directed by the City.
35. Supplemental Unit Prices for Tree Bubbler Assembly shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the items, complete in place, including trenching and backfill, lateral lines, all fittings, connection hardware, and perforated drain pipe with gravel, as indicated on the drawings, specified in these Special Provisions and as directed by the City.
36. Supplemental Unit Prices for Relocate Existing Irrigation Head shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the items, complete in place, including trenching and backfill, lateral line, all fittings, and connection hardware, as indicated on the drawings, specified in these Special Provisions and as directed by the City.
37. Supplemental Unit Prices for Remote Control Valve, Gate Valve and Quick Coupler Valve shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the items, complete in place, including trenching and backfilling, all fittings, connection hardware, valve boxes with gravel, as indicated on the drawings, specified in these Special Provisions and as directed by the City.
38. Supplemental Unit Prices for Lateral Line Class 200 PVC, Main Line Class 315 PVC, Mainline Schedule 40 PVC, Sleeves – PVC Sch 40 and Irrigation Control Wire shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the items, complete in place, including trenching and backfilling, bedding, sleeving under pavement, control wires and conduit, allowance for waste, cutting, fittings, and connection hardware as indicated on the drawings, specified in these Special Provisions and as directed by the City.
39. Supplemental Unit Prices for Import Topsoil, Bioretention Planting Media and Topdressing Soil shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the material, complete in place, to the specified depth with amendments in the specified application rate, as indicated on the drawings, specified in these Special Provisions and as directed by the City.

40. Supplemental Unit Prices for Landscape Soil Preparation and Fine Grading shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the material and amendments, complete in place, to the specified depth or in the specified application rate, as indicated on the drawings, specified in these Special Provisions and as directed by the City.
41. Supplemental Unit Prices for Turf from Sod shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the material, complete in place, and include fine grading, fertilizing and maintenance and warranty, as indicated on the drawings, specified in these Special Provisions and as directed by the City.
42. Supplemental Unit Prices for Tree – 24” Box, Tree – 15 Gallon, Shrub- 5 Gallon and Shrub/Groundcover – 1 Gallon, shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the material, complete in place, and include fine grading planting pit preparation , fertilizing and amending backfill and maintenance and warranty, as indicated on the drawings, specified in these Special Provisions and as directed by the City.
43. Supplemental Unit Prices for Bark Mulch and Root Barrier shall include full compensation for furnishing all labor, tools, equipment and incidentals for furnishing the material, complete in place, to the specified depth, as indicated on the drawings, specified in these Special Provisions and as directed by the City.
44. Where required in the Specifications, warranties apply and shall be included in the unit price.

Each bidder shall bid each item on the Bidding Schedule. Failure to bid an item shall be just cause for considering the bid as non-responsive. The City reserves the right to include or delete any Schedule or portion thereof, or to reject all bids.

Official bid documents, including plans and specifications, are available on the City of Stockton website at:

<http://www.stocktongov.com/services/business/bidflash/default.html>

All bids submitted for this project must conform to the requirements of the official bid documents, including plans and specifications.

9-1.07 UNSATISFACTORY PROGRESS

If the number of working days charged to the contract exceeds 75 percent of the working days in the current time of completion and the percent working days elapsed exceeds the percent work completed by more than 15 percentage points, the City will withhold 10 percent of the amount due on the current monthly estimate.

The percent working days elapsed will be determined from the number of working days charged to the contract divided by the number of contract working days in the current time of completion, expressed as a percentage. The number of contract working days in the current time of completion shall consist of the original contract working days increased or decreased by time adjustments approved by the Engineer.

The percent work completed will be determined by the Engineer from the sum of payments made to date plus the amount due on the current monthly estimate, divided by the current total estimated value of the work, expressed as a percentage.

When the percent of working days elapsed minus the percent of work completed is less than or equal to 15 percentage points, the funds withheld shall be returned to the Contractor with the next monthly progress payment.

Funds kept or withheld from payment, due to the failure of the Contractor to comply with the provisions of the contract, will not be subject to the requirements of Public Contract Code 7107 or to the payment of interest pursuant to Public Contract Code Section 10261.5.

9-1.08 STOP NOTICE

Section 9-1.16E(4), "Stop Notice Withholds," of the Caltrans Specifications is amended to read as follows:

At its option, the Department of Public Works may at any time retain from the amounts due to the Contractor sufficient amount to cover claims which are filed pursuant to *Section 3179 et seq of the Code of Civil Procedures*.

9-1.09 MOBILIZATION

Mobilization shall conform to the provisions in Section 9-1.16D, "Mobilization," of the Caltrans Standard Specifications and these Special Provisions.

Full compensation for any costs required to comply with the provisions in this section shall be considered to be included in the "Mobilization" price paid for on the contract items of work and no additional compensation will be allowed therefore.

DIVISION II – GENERAL CONSTRUCTION

SECTION 10 – GENERAL CONSTRUCTION

10-1.01 ORDER OF WORK

The order of work shall conform to the Contractor's approved project schedule described in Section 8-1.01, "Schedule" of these Special Provisions.

Contractor's attention is directed to the Public Safety, Public Convenience, and Maintaining Traffic sections of these Special Provisions. Nothing in this section shall be construed as to relieve the Contractor of the responsibility to stage the work in a manner that complies with the requirements of these sections.

All permits and approvals as may be required for this project shall be secured or ordered immediately after award of the contract or their acquisition timing determined, such that the same is not a cause for delay. The cost of the permits shall be included in the total bid costs.

Minor deviations from these requirements may be allowed by the Engineer, if in the opinion of the Engineer, the prosecution of the contract will be better served and the work expedited. Any Contractor request for such deviations shall not be adopted without the Engineer's prior written approval.

Full compensation for conforming to the provisions in this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore.

10-1.02 PRE-CONSTRUCTION SURVEY

The Contractor shall perform pre-construction and post-construction survey of all existing structures, pavements and other above ground facilities within the project limits prior to beginning any work, noting their condition by means of dated photographs and video.

Color photographs shall be taken with a digital camera at locations (property sites) that are appropriate to show pre-existing conditions and after constructed conditions. Each photograph shall show the date and time the photograph was taken and clearly be labeled showing the location, viewing direction, and any special features noted. Digital copies of photographs and video shall be submitted to the City prior to approval of project.

Full compensation for conforming to the provisions in this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore.

10-1.03 MONUMENTS

The Contractor shall preserve and perpetuate existing monuments, property pins, chiseled cross, etc. affected by the work included in this project in accordance with the

most current edition of the Professional Land Surveyors Act (Business and Professions Code §§ 8700-8805), Sections 8771.

The Contractor shall perform a survey to preserve any existing survey monuments such as chiseled cross, survey iron pipe, etc. that may be present on the pavement, round corners, and concrete flat work to be improved by this project. Monument preservation shall be done by or under the supervision of a Licensed Land Surveyor.

Contractor shall complete and sign City of Stockton Monument Preservation form (located in Appendix E of these Specifications).

The Contractor shall notify the Engineer immediately if any monument is disturbed. The Contractor shall be responsible for hiring a Licensed Land Surveyor to reset any survey monument disturbed by his/her operations. A new record of survey shall be filed with the San Joaquin County Surveyor's office, which copies shall be submitted to the Engineer.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore

SECTION 11 – BLANK

SECTION 12 - TEMPORARY TRAFFIC CONTROL

12-1.01 CONSTRUCTION AREA AND INFORMATIONAL SIGNS

Construction area and informational signs shall be furnished, installed, maintained, and removed when no longer required in accordance with the provisions in Section 12, "Temporary Traffic Control", of the Caltrans Specifications, Standard Specifications, and these Special Provisions.

The Contractor shall at least; install four (4) project informational signs; 4'W x 3'H in size with 3" minimum height letters at each approach to the construction area (one at each approach). Letters on the Informational signs shall be black on white background. Location of the signs shall be determined by the City Inspector.

The Contractor shall notify the appropriate regional notification center for operators of subsurface installations at least two (2) working days, but not more than fourteen (14) calendar days, prior to commencing any excavation for all the sign posts.

All excavations required to install all the signs shall be performed by hand methods without the use of power equipment, except that power equipment may be used if it is determined there are no utility facilities in the area of the proposed post holes. The post hole diameter, if backfilled with Portland cement concrete shall be at least 4 inches greater than the longer dimension of the post cross section.

Sign substrates for stationary mounted construction informational signs may be fabricated from fiberglass reinforced plastic, as specified under "Pre-qualified and Tested Signing and Delineation Materials" elsewhere in these Special Provisions.

Type IV reflective sheeting for sign panels for portable signs shall conform to the requirements specified under "Pre-qualified and Tested Signing and Delineation Materials" elsewhere in these Special Provisions.

The Contractor shall maintain accurate information on the signs. Signs that are no longer required shall be immediately covered and removed. Signs that convey inaccurate information shall be immediately replaced or the information shall be corrected. Covers shall be replaced when they no longer cover the signs properly. The Contractor shall immediately restore to the original position and location any sign that is displaced or overturned, from any cause during the progress of work.

SECTION 13 - WATER POLLUTION CONTROL

13-1.01 WATER POLLUTION CONTROL

Water pollution control shall conform to the requirements in Section 13, "Water Pollution Control," of the Caltrans Specifications, these Special Provisions, and as directed by the Engineer.

The Contractor shall develop and implement a Water Pollution Control Program (WPCP), which specifies Best Management Practices (BMPs) that will prevent all construction pollutants from contacting storm water and with the intent of keeping all products of erosion from moving off site into receiving waters. The Contractor shall inspect and maintain all BMPs.

Full compensation for furnishing, installing, maintaining all BMPs and preparing a WPCP shall be included in various contract items and no additional compensation will be allowed therefore.

The contractor shall be responsible for preparing and submitting a Storm Water Pollution Prevention Plan (SWPPP). Contractor shall submit the SWPPP to The City of Stockton representative within fifteen (15) working days of award of the contract by City Council. for review and approval. The submittal shall contain the following:

1. Vicinity Map (Can be copied from the bid specification package.)
2. SWPPP Prepared by contractor. Forms available from the City website at
http://www.waterboards.ca.gov/stormwtr/docs/const_swppp.pdf
<http://swrcb2.waterboards.ca.gov/stormwtr/construction.html>

Prior to, or concurrently, the City will file the Notice of Intent (NOI) with the State Water Resources Control Board, and will present a copy of the NOI to the contractor when accepted by the State. The contractor shall keep a complete copy of the SWPPP and the NOI on the construction site at all times.

The Contractor shall perform all operations and provide all equipment and materials necessary for complete and continuous implementation of the SWPPP as shown on the drawings and per the submitted forms.

All work shall conform to the requirements set forth in the State Water Resources Control Board. (SWRCB), Order No 99-08-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002, Waste Discharge Requirements (WDRS) for Discharges of Storm Water Runoff, associated with construction activity. In particular, the contractor's attention is directed to Section B: Monitoring program and reporting requirements and Section C: Standard Provisions for Construction activity.

Notice of Termination

Upon completion of the substantial completion review, the contractor shall prepare for the city's signature, a SWRCB Notice of Termination (NOT) of coverage under the NPDES General Permit No. CAS 000002 for Discharges of Storm Water Associated with Construction Activity.

All materials used for implementation of the SWPPP shall be new and they shall be of a manufacturer, type, and quality generally accepted for storm water pollution prevention by the construction industry.

Install, execute, and monitor all storm water pollution prevention activities per the SWPPP and as shown on the plans.

SECTION 14 - ENVIRONMENTAL STEWARDSHIP

14-1.01 AIR POLLUTION CONTROL

Attention is directed to Section 14-9.02 "Air Pollution Control" of the Caltrans Specifications.

Comply with air pollution control rules, regulations, ordinances, and statutes that apply to work performed under the contract, including air pollution control rules, regulations, ordinances, and statutes provided in government code 11017 (Pub Cont Code 10231).

Do not burn material to be disposed of.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefor.

14-1.02 DUST CONTROL, APPLY WATER, SITE MAINTENANCE, AND CLEANUP

Dust control shall conform to any requirements set forth in the San Joaquin Valley Air Pollution Control District Construction Notification Form, the provisions in Section 14-9, "Air Quality" of the Caltrans Specifications, and these Special Provisions. Use of water except for recycled, reclaimed, or other non-potable water for the purpose of dust control or other construction uses unless for health or safety purposes is prohibited. All dust control operations shall be performed by the Contractor at the time, location and in the amount ordered by the Engineer. The application of either water or dust palliative shall be under the control of the Engineer at all times." Watering shall conform to the provisions of Section 13 "Water Pollution Control" of the Caltrans Specifications and

these Special Provisions. Attention is also directed to Section 18 “Dust Palliatives” of the Caltrans Specifications and these Special Provisions.

Contractor shall prepare and submit a Dust Control Plan to the San Joaquin Valley Air Pollution Control District. The Contractor shall obtain approval at least 30 days prior to commencement of construction activities, and the Contractor shall pay all applicable fees.

The Contractor’s plan preparer for the Dust Control Plan is required to complete a training class with the San Joaquin Valley Air Pollution Control District. The training schedule is available at this website:

http://www.valleyair.org/busind/comply/PM10/forms/RegVIII_training_schedule.pdf

During construction, the Contractor shall remove all rubbish and debris as it is generated. Upon completion of the work, the Contractor shall remove all equipment, debris, and shall leave the site in a neat, clean condition all to the satisfaction of the Engineer. A permit shall be obtained from the Municipal Utilities Department, or California Water Service, as applicable, for construction water obtained from City hydrants. This permit shall be approved by the City of Stockton Fire Department.

The Contractor shall conduct and cause all working forces at the site to maintain the site in a neat, orderly manner throughout the construction operations. The work shall be conducted in a manner that will control the dust. When ordered to provide dust control, the Contractor shall use water to reduce the dusty conditions all to the satisfaction of the Engineer. During construction, the Contractor shall remove all rubbish and debris as it is generated. The Contractor shall pay to the City of Stockton the sum of Two Hundred Fifty Dollars (\$250) for every calendar day where debris has remained on the job site overnight. Upon completion of the work, the Contractor shall remove all equipment and debris, and shall leave the site in a neat, clean condition all to the satisfaction of the Engineer.

14-1.03 SOUND CONTROL REQUIREMENTS

The Contractor's attention is directed to Section 14-8.02 “Noise Control” of the Caltrans Specifications and the project specific equipment noise control measures listed in Table 8.1 below. Nothing in the Caltrans Specifications or these Special Provisions voids the Contractor’s public safety responsibilities or relieves the Contractor from the responsibility to comply with other ordinances regulating noise level.

The Contractor shall comply with all local sound control and noise level rules, regulations and ordinances which apply to any work performed pursuant to the contract. Each internal combustion engine, used for any purpose on the job or related to the job, shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project without the muffler.

To minimize the construction impacts to residents, the Contractor is encouraged to select the bore method (directional drilling) over conventional trenching to install new conduits.

The noise level requirement shall apply to the equipment on the job or related to the job, including, but not limited to, trucks, transit mixers, or transient equipment that may or may not be owned by the Contractor. All equipment shall have sound-control devices that are no less effective than those provided on the original equipment. The use of loud sound signals shall be avoided in favor of light warnings except those required by safety laws for the protection of personnel.

Project Specific Equipment Noise Control

Table 8-1 summarizes noise levels produced by construction equipment that is commonly used on roadway construction projects. Construction equipment is expected to generate noise levels ranging from 70 to 90 dB at a distance of 50 feet, and noise produced by construction equipment would be reduced over distance at a rate of about 6 dB per doubling of distance. The noise levels generated by the boring machine would be lower than any equipment listed in the table.

Table 8-1. Construction Equipment Noise

Equipment	Maximum Noise Level (dBA at 50 feet)
Scrapers	89
Bulldozers	85
Heavy Trucks	88
Backhoe	80
Pneumatic Tools	85
Concrete Pump	82

Source: Federal Transit Administration 1995.

Further, implementing the following measures would minimize the temporary noise impacts from construction:

All equipment shall have sound-control devices that are no less effective than those provided on the original equipment. No equipment shall have an unmuffled exhaust.

As directed by the Engineer, the contractor shall implement appropriate additional noise mitigation measures as warranted. These could include, but are not specifically limited to, changing the location of stationary construction equipment, turning off idling equipment, rescheduling construction activity, notifying adjacent residents in advance of construction work, and installing acoustic barriers around stationary construction noise sources. Furthermore, construction activities shall be limited to the time period between 9:00 a.m. and 5:00 p.m.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore.

14-1.04 CULTURAL RESOURCES

If cultural materials are discovered during construction, including human remains, do not disturb the resources and immediately stop all work within a 60-foot radius of the discovery and within any nearby area suspected to overlie the discovery. Immediately notify all appropriate parties including the Caltrans District 10 Local Assistance archaeologist, the Local Assistance Engineer (DLAE), and the County Coroner if human remains are found. Do not move cultural materials or take them from the job site. Do not resume work within the discovery area until authorized. Additional protocols for human remains are given in the State Health and Safety Code Section §7050.5 and §5097.98.

Full compensation for doing all the work involved in trench excavation, water control and dewatering, bedding and backfilling, placement of temporary paving, and cultural resources shall be considered as included in the contract prices paid for the various items of work and no additional compensation will be made therefore.

14-1.05 ASBESTOS AND LEAD-CONTAINING PAINT

An asbestos and lead-containing paint survey was conducted on the existing site structures. This survey has determined that Category I nonfriable/non-hazardous asbestos has been identified at locations on the site.

Asbestos on this project includes 20 square feet of 8" pipe gaskets (in pool basement mechanical space). Removal of these Category I nonfriable/non-hazardous asbestos pipe gaskets are covered by the Cal/OSHA asbestos standard (Title 8, CCR §1529).

If gaskets are not disturbed during removal (ie. cut and wrap sections of pipe where the gaskets are located) they may be removed by a contractor with asbestos awareness training. Otherwise, removal of the gaskets shall be by a CA licensed asbestos abatement contractor.

Personnel not trained for asbestos work should be instructed not to disturb asbestos.

The contractor is responsible for segregating and characterizing waste streams prior to disposal and for informing the landfill of the contractor's intent to dispose of asbestos waste.

Lead-containing painted surfaces have also been identified at the site. These painted areas are lead-containing but not at hazardous levels in regards to wastestream disposal. However, Cal/OSHA regulations still apply to any worker that may be disturbing the painted surfaces and workers should be aware that (very low levels) of lead are present.

Personnel working with these lead-containing painted surfaces shall have lead awareness training.

Contractor shall refer to the Asbestos and Lead-Containing Paint Survey Report in Appendix B of the specifications for additional information regarding the locations and levels of these materials and requirements related to exposure, handling, removing, disturbing and disposing of asbestos and lead-containing paint as part of this project.

14-1.06 BIRD SURVEY

The City of Stockton is required to seek coverage under the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP) provided by the San Joaquin Council of Government (SJCOG) if the project has potential impacts to biological resources and ground disturbance. The Resident Engineer shall coordinate with (SJCOG) on performing preconstruction bird survey 45 days prior to start of construction. In the event of an animal nesting in the construction area, SJCOG will do a biological assessment to determine the buffer zone that the contractor would need to avoid. This buffer zone fencing will be provided by the contractor and any compensation related to this will be evaluated by the City at that time.

SECTION 15 – EXISTING FACILITIES

Existing Facilities shall conform to the requirements in Section 15, “Existing Facilities,” of the Caltrans Specifications, these Special Provisions, and as directed by the Engineer.

15-1.01 UTILITY FACILITIES

Attention is directed to the possible existence of underground utilities not known to the City or in a location different from that which is shown on the plans or in these Special Provisions. The Contractor shall take steps to ascertain the exact location of such facilities prior to doing any work that may damage such facilities or interfere with their service.

15-1.02 AC PAVEMENT REMOVAL

Asphalt concrete pavement and aggregate base shall be removed by saw-cutting and excavation or cold planning to the lines, depths, and dimensions indicated on the plans and/or as directed by the Engineer.

Full compensation for conforming to the provisions of this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore.

15-1.03 CONCRETE REMOVAL

Existing concrete sidewalk, gutter, curb and gutter, curb ramps, and other concrete surfacing, where shown on the plans to be removed, shall be removed and disposed of. Saw cut concrete ramps, walks, curbs, and gutters to be removed at the nearest joint or score line, at the locations indicated on the plans, and as designated by the Engineer.

Payment for removal of existing facilities for which specific bid items are not provided, shall be considered as included in the contract prices paid for various items of work, and no additional compensation will be provided therefore.

15-1.04 SURFACE RESTORATION

Surface restoration shall consist of restoring all areas within the limits of work to their original existing condition prior to construction or to the condition shown on the plans or specified in the Specifications.

The Contractor shall restore all paved areas, such as driveways, curb and gutter, roadway surfaces, ditches, concrete, etc., landscaped areas, and all other improvements disturbed or damaged by his operations; including concrete damaged as part of the work.

Payment for the restoration of damaged areas, for which specific bid items are not provided, shall be included in the prices paid for various items of work and no additional compensation will be allowed therefore.

15-1.05 ADJUSTING UTILTIY COVERS AND FRAMES

Attention is directed to Section 71-5.03B, "Frames, Covers, Grates, and Manholes", of the Caltrans Specifications.

Existing maintenance hole frames and covers, lamp holes, monitoring wells, fire hydrant and water valve boxes that are owned by the City shall be lowered prior to the cold planning operation and adjusted to the finish pavement grade of new pavement. All existing survey monument and traffic detector handhole shall be removed and replaced. Contractor shall tie down location of existing DH's and survey monuments.

These existing facilities shall be lowered a minimum dimension of 13" from existing finished grade. This dimension shall be verified by the Contractor. All castings shall be brought to finish grade after the final pavement lift has been installed. The manhole openings shall be temporarily covered by suitable means, preferably with building paper. A circular or square saw cut at least twelve (12) inches deep using diamond pavement cutters shall be made at least twelve (12) inches (six (6) inches for covers less than ten (10) inches diameter size) from the manhole. If square saw cuts are used, the diagonal of the square shall align with the direction of travel. Smooth and clean cut of pavement is mandatory. Jackhammer can be used to break and remove the material after the saw cut; however, the use of jackhammer will not be allowed in lieu of pavement saw.

The manholes and valves shall be raised by installing concentric grade rings (pre-cast concrete) and/or leveling mortar. The Contractor shall furnish grade rings fitting the configuration of the existing frame. Contractor must comply with City Standards for the adjustment of existing utilities.

The concrete used shall comply with provisions of Caltrans Specifications section 90-2, Minor Concrete. Use of high early-strength modified concrete is recommended. The concrete shall be placed up to one and one-half (1.5) inch lower than the surface of the adjacent pavement and three (3) inches at intersections and 100 LF approaches. A final lift of one and one-half (1.5) inch and three (3) inch of hot-mix asphalt shall be placed only after concrete is cured and have gained enough compressive strength to withstand the force of the compactor.

All finished adjusted frames and covers shall be level with or up to one-eighth (1/8) inch lower than adjacent pavement surface. The work shall be performed to present a neat and thorough workmanlike appearance upon completion, and result in a smooth ride over it. A six-foot straight-edge will be placed over the utility cover to check for this requirement.

Any damage to the existing facilities caused by the Contractor shall be repaired or replaced to the satisfaction of the Engineer at the expense of the Contractor.

Catch basin frame, grate, steel pull box etc., shall be adjusted to grade using new materials, and the existing frame and grate shall be reused to the extent possible as directed by the Engineer. The catch basin shall be raised as directed in the field by the Engineer.

All utility adjustment and valve box replacement, other than the City of Stockton's, shall be at the expense of the owner of the utility. Contractor shall be responsible for all utility coordination and shall contact each utility company requesting them to lower their facilities prior to grinding and adjust their facilities to finished grade of new pavement. Contractor shall include and incorporate outside utility companies time frames for utility adjustments within the baseline schedule of the project. Vault that can't be adjusted by the owner of the utility, contractor shall work around these vault by other method and equipment.

On completion of placement of overlay on each street, all utility covers (maintenance hole, water valve, lamp hole, and detector handhole covers, etc.) shall be clean and free of any hot-mix asphalt and shall seat securely in their frames.

Payment to adjust covers and frames, which specific bid items are not provided, shall be considered as included in the contract prices paid for various items of work, and no additional compensation will be provided therefore.

15-1.06 ROADSIDE SIGNS

Unless otherwise shown on the plans, the Contractor shall maintain existing roadside signs in place. The Contractor shall replace or repair all signs damaged by his operations and under this contract by using new material. Such material shall be a replacement of the original in regards to type of sign, posts, and construction. Relocation of the existing signs shall be done the same day the sign is removed from its original location.

At the Contractor's option, existing signs may be temporarily removed in order to facilitate the Contractor's construction of other improvements included under this contract. Any sign which is removed or damaged by the Contractor's shall be

reinstalled at its original location using new unistrut posts in conformance with the Standard Specifications. Existing steel pipe sign posts shall be salvaged as directed by the Engineer. Each roadside sign shall be reinstalled on the same day that the sign is removed.

DIVISION III – GRADING

SECTION 16 – DEMOLITION, CLEARING AND GRUBBING

16-1.01 CLEARING AND GRUBBING

Shall conform to the requirements of Section 17-2, "Clearing and Grubbing", of the Caltrans Specifications and these Special Provisions including Section 02 41 19

"Selective Site Demolition & Structures Demolition".

This section shall consist of all clearing, grubbing, stockpiling, and removals and demolition including fences, utility poles, pavements, buildings/structures, curbs, gutters, irrigation components, benches, drinking fountain and other miscellaneous demolition as shown on the plans or specified herein.

All materials removed shall be off hauled and disposed of by the Contractor.

Attention is directed to Section 19-1.03D, "Buried Man-Made Objects", of the Caltrans Specifications.

Review

Contractor shall review with City's Representative the exact limits of work and extent of materials to be removed.

1. Examine site and structures and determine exact nature and status of structural elements and utilities prior to commencing demolition.
2. City assumes no responsibility for actual condition of items or structures to be demolished.
3. Prior to commencing the work, perform a site survey to identify existing areas of damage to adjacent building areas and other buildings.

Standards

All work shall conform to ANSI A10.6, Safety Requirements for Demolition Operations and to the codes and regulations of the City.

All work shall conform to these Special Provisions, as well as all applicable codes of governmental agencies having jurisdiction over the work.

See Appendix A: Geotechnical Report, "Geotechnical Investigation, McKinley Park Renovation", dated April 2022, by Geocon Consultants, Inc. .

Schedule

Submit schedule indicating proposed methods and sequence of operations for selective demolition work for review prior to commencement of work. Include coordination for shut-off, capping, and continuation of utility services as required.

1. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of adjacent building uses.
2. Coordinate continued occupancy with adjacent building tenants.

Execution

Demolition of Structures: Provide a minimum of 72 hours advance notice of demolition activities.

- A. Protection: Provide temporary barricades and other forms of protection as required to protect general public from injury due to selective demolition work. Provide protective measures as required to provide free and safe passage of general public to and from occupied portions of building. Erect temporary covered passageways as required by authorities having jurisdiction.
- B. Environmental Controls: Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level. Comply with governing regulations pertaining to environmental protection.
- C. Utilities: Disconnect all utilities to structures to be demolished in the manner prescribed by the utility company.
- D. Selective Demolition: Perform selective demolition work in a systematic manner. Use methods required to complete work indicated on the drawings in accordance with demolition schedule and governing regulations. Conduct selective demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.
- E. Traffic: Do not close, block or otherwise obstruct streets, walks, or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- F. Extent: Demolish foundation walls and footings to a depth of not less than 12 inches below finish grade. Demolish and remove below-grade wood, concrete or metal construction. Break up below grade concrete slabs. Completely fill below-grade areas and voids resulting from demolition work. Provide fill consisting of approved earth, gravel or sand, free of trash and debris, stones over 6 inch diameter, roots or other organic matter.
- G. Clean-up: Remove debris, rubbish and other materials resulting from demolition operations from building site. Transport and legally dispose of materials off site.
- H. Damages: Promptly repair damages caused to adjacent facilities by demolition work at no cost to the City.
- I. Contractor Salvage: Items indicated to be removed but of salvageable value to the Contractor may be removed from structure as work progresses. Transport Contractor salvaged items from site as they are removed. Storage or sale of removed items on site will not be permitted.

Stockpiling

Existing asphaltic paving, aggregate base and concrete rubble shall be stripped and stockpiled for re-use as aggregate base beneath parking paving. Materials not conforming to requirements for aggregate base as defined in "Aggregate Base" - Section 26, A shall be removed and properly disposed of off-site.

Clearing and Grubbing

Contractor shall strip the site of all remaining materials not to remain as part of the finished work. All such materials shall be legally disposed of off-site at Contractor's expense except as otherwise noted on drawings. Items to be disposed of off-site include but are not limited to the following:

1. Trees, stumps, weeds, roots and other organic material, wood and trash.
2. Pavements and base rock
3. Concrete pavements curb and gutter
4. Asphalt pavements
5. Chain link fencing and footings.
6. Any rubble remaining from demolition of buildings
7. Utility poles
8. Chain link fabric and portions of posts from existing fence section to be modified.

For the purposes of this project scope, all trees and stumps (with a caliper or diameter at breast height (DBH) under 6-inch), weeds, grass, shrubs, roots and other organic material shall be removed where clear and grub is indicated on the plans. Trees and stumps with a DBH greater than 6-inches shall be removed where specifically indicated as "(E) TREE TO BE REMOVED" on the plans.

Strip and remove weeds and trash from unpaved areas to be improved. Leave intact ornamental shrubs and trees as identified by City's Representative. The contractor shall protect surrounding areas from damage by equipment or construction operations.

Tree stumps shall be removed to a minimum of one foot below existing grade and deeper as necessary to accomplish construction of the improvements indicated on the Plans.

All edges of existing paving to remain shall be sawcut in a neat clean manner.

All excavation within the drip line of trees to remain shall be accomplished in a careful manner. No roots greater than one-inch diameter shall be cut. Where excavation reveals roots greater than one-inch diameter that will interfere with construction, Contractor shall notify City's Representative for direction prior to proceeding.

Where any marked or unmarked utility lines or other underground obstruction or piping may be encountered within the work area, notify the City's Representative or the agencies or service utility companies having jurisdiction thereof, and take necessary measures to prevent interruption of service (if live). Should such lines or service be damaged, broken, or interrupted, those services shall be repaired immediately and restored by him at his own expense.

Abandoned lines, meters and boxes, obstructions or piping shall be removed, plugged or capped in accordance with the requirements and approval of the agencies affected. It shall be the responsibility of the Contractor to ascertain whether any public facilities exist along the line of work, whether or not shown on the plans; and Contractor shall, at the Contractor's expense, do any necessary work to save from damage all such property in or adjacent to the work, and shall repair all damage thereto caused by the

Contractor's operations.

Service connections to adjacent properties requiring removal or adjustment, due to new construction, will be so removed or adjusted during the course of construction operations. The Contractor shall cooperate with the utility companies and/or agencies in such work.

Prior to commencement of site grading work the Contractor shall notify the City's Representative that the site has been cleared. Site grading shall not commence until the City's Representative has completed review of the site and has given approval to proceed.

Existing underground structures, trash, debris, loose fill, tree roots, tree remains, organic surficial soil, and other rubbish shall be removed or otherwise disposed of so as to leave the areas that have been disturbed with a neat and finished appearance, free from debris. Depressions left from any removals shall be properly filled and compacted in accordance with these Special Provisions, and as directed by the Engineer.

The methods for removal of subsurface irrigation and utility lines will depend on the depth and location of the line in relation to planned improvement. Unless otherwise specified, remove the pipe and compact the soil in the trench according to the applicable portions of these Special Provisions.

Where loose, uncompacted fill occurs at the surface of the site, the materials shall be excavated to expose firm natural ground or previously compacted fill. The exposed surface shall then be prepared to receive fill in accordance with the applicable portions of these Special Provisions.

Nothing herein shall be construed as relieving the Contractor of his responsibility for final cleanup within the project limits.

SECTION 17 – BLANK

SECTION 18 – BLANK

SECTION 19 – EARTHWORK

19-1.01 PATH AND ROADWAY EXCAVATION

Roadway excavation shall conform to the requirements of Section 19, "Earthwork", of the Standard Specifications, Caltrans Specifications, and these Special Provisions. Wherever relative compaction is specified, it shall be determined by ASTM D1557.

Surplus excavated material shall become the property of the Contractor and shall be disposed of outside the highway right-of-way in accordance with the provisions in Section 19-2.03B, "Surplus Material", of the Caltrans Specifications. All excavated material shall be loaded for off-haul from the site as it is generated.

Material will not be allowed to accumulate within the right-of-way.

Contaminated Soil

Identify contaminated soil from spills or leaks by noticing discoloration, odors, or differences in soil properties. Soil with evidence of contamination must be sampled and tested by a laboratory certified by Environmental Laboratory Accreditation Program (ELAP).

If levels of contamination are found to be hazardous, handle and dispose of the soil as hazardous waste.

Prevent the flow of water, including ground water, from mixing with contaminated soil by using one or a combination of the following measures:

1. Berms
2. Cofferdams
3. Grout curtains
4. Freeze walls
5. Concrete seal course

If water mixes with contaminated soil and becomes contaminated, sample and test the water using a laboratory certified by ELAP. If levels of contamination are found to be hazardous, handle and dispose of the water as hazardous waste. Contractor shall obtain a State Identification Number from the Engineer for hazardous material disposal.

Upon completion of underground facilities and backfilling of the trenches in each portion of the work, the subgrade shall be prepared by compacting to a relative compaction of not less than ninety-five (95) percent for a minimum depth of zero point five (0.5) feet below the grading plane (sub-grade plane) for a total width of the area to be paved.

All portland cement concrete flatwork shall be saw-cut to full depth prior to removal. All monolithic Portland cement concrete shall be saw-cut a minimum of 8 inches deep prior to removal.

Existing asphalt concrete sections along concrete curb and gutters shall be neatly saw cut to full depth of existing asphalt pavement and removed neatly. The top six inches of the sub-grade shall be compacted to 90% of the maximum density at near optimum moisture content.

Replace the 2nd, 3rd, and 4th paragraphs of section 19-2.03B of Caltrans Standard Specifications with:

Dispose of surplus material.

19-1.02 TRENCH EXCAVATION AND BACKFILL

Trench excavation, pipe bedding, and backfill shall conform to the requirements of Section 71, "Sanitary Sewer and Storm Sewers", of the Standard Specifications and City of Stockton Standard Plan Nos. R36 through R43, and any amendment and revisions, these Special Provisions, and as specified on the plans. Controlled Density Fill (CDF) shall be mandatory for trenches 8" wide or less. Contractor shall grind 3" deep, 12" each side of trench, and repave. If excavation exceeds 15 feet in depth, water sampling will be required.

Water control shall conform to the provisions of Section 19-3.03B(5) "Water Control and Foundation Treatment" of the Caltrans Specifications and these Special Provisions. The Contractor shall construct and maintain all necessary ditches, cofferdams, channels, drains, sumps, and temporary protective works, and shall furnish, install, and maintain all necessary pumping and other equipment for controlling flows, including ground water in the pipe trenches and structure excavations, so that no foundation will contain any free water. Full compensation for water control shall be included in the contract prices paid for various items of work, and no additional compensation will be made therefore.

The Contractor shall do all excavation of whatever substance is encountered to the lines and grades shown on the plans. Where it becomes necessary to excavate beyond the limits of normal excavation lines in order to remove boulders or other interfering objects, the void remaining after the removal of the boulders shall be backfilled with suitable material and density, as approved by the Engineer. The Contractor shall do such grading as is necessary to prevent surface water from entering the excavation. The Contractor shall remove and dispose of all water entering the excavation. Disposal of water shall be done in a manner to prevent damage or nuisance to adjacent properties.

Due to width limitations, proximity of existing utilities, structures, and access requirements, the Contractor may be required to provide a vertical, open trench, shoring system for portions of this project. Shoring of all trench excavations shall conform to the Sheeting and Shoring Section of these Special Provisions.

The amount of open trench or plated trench permitted at any one time shall not exceed fifty (50) feet or as allowed by the Engineer. Trench excavation shall be closed and all lanes shall be restored to traffic at the end of each workday. The Contractor shall furnish and install non-skid steel plates to span trench sections, which have not been backfilled. Non-skid trench plates shall have a manufactured surface with a coefficient of friction that equals or exceeds zero point thirty-five (0.35).

Approach and ending plates shall be attached to the roadway by a minimum of two (2) dowels predrilled into the corner of the plate and drilled a minimum of two (2) inches into the pavement. Interior plates are to be butted together. Fine graded asphalt concrete shall be compacted to form ramps with a maximum slope of eight and one-half percent (8.5%) with a minimum twelve- (12) inch taper to cover all exterior edges of the plates. When the plates are removed, the dowel holes in the pavement shall be backfilled with graded fines of asphalt concrete mix. A concrete slurry or equivalent slurry mix may be substituted with the approval of the Engineer.

All operations shall be carried out in an orderly fashion. Backfilling, compacting, and clean-up work shall be accomplished as the work is approved and traffic through the work shall be impeded or obstructed as little as possible.

The trench bottom shall be free of bumps or hollows and graded to provide uniform support along the length of pipe.

Excess excavated material shall become the property of the Contractor and shall be removed and disposed of away from the job site at the Contractor's expense. Full compensation for the removal and disposal of excess or unsuitable material shall be considered included in the contract unit prices paid for the various items of work and no additional compensation will be allowed therefore.

Pipe bedding and backfill shall be placed above and below the pipe to the lines and grades shown on the City of Stockton Standard Plans Nos. R36 through R43, as shown on the plans, and as specified in these Special Provisions.

Delete Section 19-3.03E, "Structure Backfill", of the Caltrans Specifications and substitute the following:

1. "Pipe bedding, envelope, and trench backfill material shall consist of imported material, free from vegetable matter and other deleterious substances and shall form a firm, stable base when compacted. The percentage composition weight by weight shall conform to the following grading:

<u>Sieve Size</u>	<u>Percentage Passing</u>
1"	100
¾"	90-100
No. 4	35-60
No. 30	10-30
No. 200	2-9

The material shall conform to the following quality requirements:

	<u>Requirements</u>
Resistance(R-value)	78 min.
Sand equivalent	25 min.

In no case shall native excavated material be used as pipe bedding, envelope, and trench backfill.

Bedding material shall be placed to approximately the same elevation on both sides of pipe to prevent unequal loading and displacement of the pipe. The difference in elevation of the bedding backfill on either side of pipe shall not exceed six (6) inches at any time.

Trench backfill shall consist of the trench area from the top of the pipe bedding to the ground surface, or if within a roadway, to the bottom of the roadway subgrade.

Backfill shall be compacted by impact, vibration, or by a combination of these methods, as approved by the Engineer. However, impact type compactors shall not be used around or over PVC pipe until backfill over the top of the pipe will permit compaction of the backfill material without deflecting or damaging the pipe. Jetting will not be permitted.

All backfill shall be placed in maximum eight (8) inch uncompacted lifts.

Compaction shall be determined by ASTM D1557.

The Contractor shall place temporary surfacing promptly after backfilling and shall maintain such surfacing until permanent paving work can be installed.

Temporary paving shall consist of asphalt cutback rolled to provide a smoother surface. All edges shall be contoured to provide a smooth transition between the existing grade and the cutback surface. The Contractor shall maintain the surface free of depressions,

bumps, loose pieces, and other defects at all times. During wet weather, the Contractor shall provide a solid, non-skid surface over temporary pavement to protect the surface from damage by traffic.

Temporary pavement shall be replaced with permanent pavement, as soon as is practical after the trench is backfilled and as allowed by the Engineer.

Until the permanent pavement is placed, the base rock and temporary asphalt plant mix at the surface of the trench shall be maintained at all times. Continuous inspection and maintenance of the trench area will be required.

Any excavation shall also conform to the provisions in Section 100, "Street Opening and Pavement Restoration Regulations" of the Standard Specifications.

Full compensation for doing all the work involved in trench excavation, water control and dewatering, bedding and backfilling, and placement of temporary paving shall be considered as included in the contract prices paid for the various items of work requiring "Earthwork" and no additional compensation will be made therefore.

SECTION 20 – BLANK

SECTION 21 – EROSION CONTROL

Attention is directed to the provisions in Section 21, "Erosion Control", of the Caltrans Specifications.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in erosion control, including the maintenance, shall be considered as included in the lump sum price paid for "Erosion Control" and no additional compensation will be allowed therefore.

SECTIONS 22-25 – BLANK

DIVISION IV – SUBBASES AND BASES

SECTION 26 – AGGREGATE BASES

26.1.1 AGGREGATE BASE

Unless otherwise indicated in these Special Provisions or indicated on the plans, aggregate base shall conform to the requirements of Section 26, "Aggregate Bases", of the Caltrans Specifications for Class 2 aggregate base.

Aggregate base shall be placed in lifts no greater than eight (8) inches in loose thickness and in a manner that avoids segregation, moisture conditioned as necessary, and compacted to at least ninety-five percent (95%) relative compaction.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in construction of the various depths of aggregate base, complete in place, will be considered as included in the contract prices paid for various items of work requiring aggregate base, and other items of work, and no additional compensation will be allowed therefore.

SECTIONS 27-36 – BLANK

DIVISION V – SURFACING AND PAVEMENT

SECTION 37 – BITUMINOUS SEALS

37-1.01 PRIME COAT

Liquid asphalt conforming to the provisions of Section 92, “Asphalt Binder” of the Caltrans Standard Specifications

Prior to placing asphalt concrete apply prime coat to the compacted aggregate base surfaces as set forth in Section 37, “Bituminous Seals”, of the Caltrans Standard Specifications.

Payment for supplying and applying prime coat shall be included in the various items of work, and no additional compensation will be allowed therefore.

37-1.02 TACK COAT

Asphaltic Emulsion conforming to the provisions of Section 94, “Asphaltic Emulsions” of the Caltrans Standard Specifications

Prior to placing asphalt concrete apply tack coat to vertical surfaces as set forth in Section 37, “Bituminous Seals”, of the Caltrans Standard Specifications.

Payment for supplying and applying tack coat shall be included in the various items of work, and no additional compensation will be allowed therefore.

37-1.03 PAVEMENT SEAL

Seal coat shall be in accordance with the provisions of Section 37-5, “Parking Area Seals,” of the Caltrans Standard Specifications and these Special Provisions.

Full compensation for furnishing all labor, materials, tools equipment, and incidentals including cleaning existing AC surface, supplying and placing asphalt emulsion and aggregates as required and doing all work involved to seal coat bike path, complete in place, will be considered as included in the contract square foot price paid for “Slurry Seal” and no additional compensation shall be allowed therefore.

37-1.04 CRACK SEALING AT PARKING LOTS

Crack sealant shall be in accordance with the provisions of Section 37-6, “Crack Treatment,” of the Caltrans Standard Specifications and these Special Provisions.

Work covered by this section includes cleaning out and sealing cracks ¼-inch or greater in existing asphalt concrete pavement areas in the parking lots. Crack sealing at the sports courts is covered under specifications Section 32 18 24 - Sports Court Surfacing

Contractor shall submit certifications from suppliers stating compliance of materials with the requirements of this section.

Sealant

Crack seal material shall consist of a single component, hot-applied, elastically modified asphalt composition specifically produced for effective pavement maintenance joint sealing.

Surface Preparation

Cracks 1/4" and wider shall be blown clean of all organic materials with a high pressure air nozzle and/or a mechanical cleaning process to a depth of 1/2" minimum. Cleaning shall result in surfaces which are free from all dust, moisture or other contaminants and shall be approved by the Engineer.

Crack Seal Application

Cracks to be filled shall be completely dry at the time of filling, and in no case shall crack sealing be performed within 24 hours of any precipitation. Sealant shall be applied when the pavement surface temperature exceeds 50°F. Application at lower temperatures may result in reduced adhesion due to possible presence of excess moisture.

The asphalt-rubber crack seal shall be heated to a minimum temperature of 300°F but not greater than 350°F. The material shall be held in the mixing tank at application temperature until very little separation of the rubber and asphalt occurs when a bead of sealant material is placed on the pavement. Sealant material may be added to the mix if the minimum temperature of 300°F is maintained.

Crack Sealant material shall be applied to all cracks 1/4-inch or greater to be flush with the adjacent pavement surface. Cracks shall be sealed from the bottom up. Excess sealant shall be leveled to less than a 1/8-inch thickness with a squeegee or sealing shoe to produce a band which is 2 to 4 inches wide, centered over the crack.

Traffic shall not be allowed on the freshly applied crack seal material until it has cured or until it has been sanded to prevent tracking. Reinforcing fabric, if called for, shall not be placed for at least 24 hours after crack sealing.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in crack sealing, including the maintenance period, shall be considered as included in the prices paid for the various items of work and no additional compensation will be allowed therefore.

SECTION 38 – BLANK

SECTION 39 – HOT MIX ASPHALT

39.1.1 Asphalt concrete

Shall be in accordance with the provisions of Section 39-2, "Hot Mix Asphalt", of the Standard Specifications, Caltrans Specifications and these Special Provisions.

Asphalt concrete for base and surface course paving shall be 1/2-inch HMA Type A aggregate. Asphalt concrete shall have a viscosity grade of PG_64-16 as specified by Caltrans Standard Specification Section 92.

Spreading equipment shall conform to the applicable provisions of Section 39—2.01C(2) “Spreading, and Compacting Equipment” of the Caltrans Specifications. Nominal thickness of top layer/overlay shall be a minimum of one and one half (1-1/2) inches.

Compaction of the asphalt concrete shall conform to City of Stockton Standards requirements.

Alternate compacting equipment or substitution of a vibratory roller for a pneumatic-tired roller will not be permitted or approved unless vibration monitoring as approved by the Engineer.

If requested by the Engineer, the Contractor shall provide a ski on the paving machine.

If poor quality paving joints show deterioration or open areas that allow water through the paving within one (1) year of paving, the Contractor will be required to fog seal for the full joint length for a minimum six (6) foot wide pass. All costs for seal will be at no additional cost to the City of Stockton.

Asphalt concrete shall not be placed adjacent to the curb and gutter until the area behind the curb and gutter is fully backfilled and compacted. It shall be the Contractor's responsibility, based on weather predictions, to schedule his paving operations to avoid paving in the rain or fog. If the day's operations are canceled because of predicted rain or fog, a non-working day will be allowed regardless of actual working conditions. The Engineer will determine whether the day's operation shall be canceled due to predicted rain or fog.

Asphalt concrete shall not be placed on any surface, which contains ponded water or excessive moisture in the opinion of the City Engineer.

If paving operations are in progress and rain or fog forces a shutdown, loaded trucks in transit shall return to the plant, and no compensation will be allowed therefore.

The Contractor shall furnish and use canvas tarpaulins to cover all loads of asphalt from the time that the mixture is loaded until it is discharged from the delivery vehicle, unless otherwise directed in writing by the Engineer.

The area to which paint binder has been applied shall be closed to public traffic. Care shall be taken to avoid tracking binder material onto existing pavement surfaces beyond the limits of construction.

No traffic shall be allowed on to the area to which paint binder has been applied with the exception of vehicles unloading asphalt concrete. All vehicles involved with the Contractor's operations shall turn around within the road right-of-way. Driveways and other private property shall not be used without prior written consent of the involved property owner, a dated copy of which shall be delivered to the Engineer prior to the use thereof.

Payment for supplying and placing asphalt binder, tack coat, supplying, preparing, placing and compacting asphalt concrete shall be included in the various items of work, and no additional compensation will be allowed therefore.

SECTIONS 40-47 – BLANK

DIVISION VI – STRUCTURES

SECTION 48 - TEMPORARY STRUCTURES (SHORING AND BRACING)

48-1.01 GENERAL

Trench shoring and bracing shall conform to the provisions of Cal-OSHA and the Division of Industrial Safety Orders.

This section applies to any person doing work in accordance with any permit issued by the City.

48-1.02 CONSTRUCTION

The Contractor shall obtain any necessary permits from the State of California, Division of Industrial Safety. The Contractor shall pay all costs in connection with said permits and proof of such permits shall be submitted to the Engineer prior to commencing trench work.

48-1.03 GENERAL DESIGN REQUIREMENTS

Design excavation support systems to meet requirements and standards of the Occupational Safety and Health Administration (OSHA).

Design excavation support systems to meet the requirements of California Code of Regulations, Title 8 – Construction Safety Orders and California Labor Code Sections 6705 to 6707.

Design structural steel members in accordance with the American Institute of Steel Construction (AISC) Manual of Steel Construction Allowable Stress Design and the Uniform Building Code.

Excavation support systems for trench excavations shall be selected by the Contractor based on the soil conditions, depths of trench excavations, groundwater conditions and other site conditions. No attempt has been made by Engineer to define acceptable trench shoring options.

Excavation Support System shall prevent running, caving, raveling, and sloughing of excavation walls and associated loss of adjacent ground.

Shoring and bracing systems shall be designed to assure worker safety and optimal conditions for pipe installation and minimize damage to adjacent pavement utilities.

Allowable Deflection: No more than 1/2-inch at any point on the shoring system.

48-1.04 PERFORMANCE CRITERIA

The Contractor shall be solely responsible for, and bear the sole burden of cost for, any and all damages resulting from improper shoring or failure to shore.

The safety of workmen, the protection of adjacent structures, property and utilities, and the installation of adequate supports for all excavations shall be the sole responsibility of the Contractor.

The design, planning, installation, and removal, of all shoring shall be accomplished in such a manner as to maintain stability of the required excavation and to prevent movement of soil and rock that may cause damage to adjacent shoring systems, structures, and utilities, damage or delay the work, or endanger life and health.

If a moveable trench shield is used during excavation operations, widen the trench width so that the shield is free to be lifted and then moved longitudinally without binding against the trench sidewalls.

48-1.05 GEOTECHNICAL INFORMATION

Geotechnical Investigation prepared by Geocon Consultants, Inc., project number S2115-05-01, dated April 2022.

48-1.06 SUBMITTALS

Copy of Contractors' annual trench and /or excavation permit issued by State Division of Occupational Safety and Health.

Detailed shoring and bracing plan signed by a civil or structural Engineer registered in the State of California.

Review of the shoring and bracing plans by the Engineer in no way relieves the Contractor from complete responsibility for providing effective and safe shoring and bracing systems.

48-1.07 INSTALLATION AND REMOVAL

Excavate only as much as can safely stand unsupported prior to installing shoring, but in no case more than 4 feet shall be left unsupported at any time. Install lagging immediately after excavation.

All shoring and bracing shall be completely removed. Removal of shoring shall:

1. Be performed in step with backfilling sequence (shoring should not be removed ahead of backfilling).
2. Not cause loosening or shifting of backfill, particularly within the pipe embedment material.
3. Not cause damage to finished pipeline, structures, pavements, or other utilities.
4. Any void space created by shoring should be completely filled with Controlled Density Fill (CDF).

Full compensation for any costs required to comply with the provisions in this section shall be considered to be included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

SECTIONS 19-55 – BLANK

SECTION 56 – SIGNS

Signs shall be in accordance with the plans, provisions of Section 82, "Signs and Markers," of the Caltrans Standard Specifications and these Special Provisions.

Signs shall be fabricated from a single sheet aluminum panel as set forth in Section 82-2.02E, "Single Sheet Aluminum Panels" of the Caltrans Standard Specifications.

General Construction Informational Signs: At least two day in advance of any construction activity, the Contractor shall install a project information construction sign(s) 24" by 48" in size (minimum) with 2" minimum height letters, at the site where construction work is occurring. Letters shall be black on white background. Location of the sign(s) shall be determined by the Landscape Architect. All materials used shall be durable and resistant to the elements (including weather conditions) and graffiti. Proof of sign and description of materials and construction of sign must be submitted to City for approval prior to printing and fabrication. Compensation for this item shall be included in the base bid. Information on the sign shall include the name of the Contractor, the general project description and a twenty-four hour telephone number for the contractor.

Prop 68 Informational Signs: At least two day in advance of any construction activity, the Contractor shall install a Prop 68 project information sign per the plans. Sign shall include 1" minimum height letters. Letters shall be black on white background. Location of the sign(s) shall be determined by the Landscape Architect. Compensation for this item shall be included in the base bid. The sign must display the Parks and Water Bond Act logo (<https://resources.ca.gov/grants/Grant-Program-Resources>, click on the logo artwork section.) and display the logo to maximize visibility and durability. The logo must be a minimum of 24" x 24". The signs must contain the following language:

Gavin Newsom, Governor

Wade Crowfoot, Secretary for Natural Resources

Armando Quintero, Director, California Department of Parks and Recreation

All materials used shall be durable and resistant to the elements (including weather conditions) and graffiti. The sign must be available during construction, at the final inspection of the project, and remain in place for a minimum of four (4) years from date of project completion. Proof of sign and description of materials and construction of sign must be submitted to City for approval prior to printing and fabrication.

SECTIONS 57-72– BLANK

DIVISION VIII - MISCELLANEOUS CONSTRUCTION

SECTION 73 – CONCRETE CURBS AND SIDEWALKS

73-1.01 CONCRETE CURBS, PLAY AREA CURBS, MOWBANDS, SIDEWALKS, PLAY AREA RAMPS AND ADA CURB RAMPS

Concrete curb, gutter, sidewalk, curb returns, including wheelchair ramps, grooving, driveways, and flat work, shall be in accordance with the provisions of Sections 73, "Concrete Curbs and Sidewalks", and 90, "Concrete", of the Caltrans Standard Specifications, these Special Provisions, and as shown on the plans.

Portland cement concrete shall conform to Section 90-2, "Minor Concrete," of the Caltrans Specifications and shall contain not less than 505 pounds of cementitious material per cubic yard for all uses. Certification of the concrete shall be received from the vendor and delivered to the City Inspector at the time the concrete is poured.

The Contractor shall sawcut all existing concrete curb, gutter and sidewalks, driveways, and other concrete improvements that will be matched with new improvements at the locations indicated on the plans and where directed by the Engineer.

Expansion joints shall be constructed wherever required by the Standard Specifications, at the locations indicated on the plans, and where directed by the Engineer. Expansion joints shall be filled with 3/8"-thick premolded expansion joint filler conforming to ASTM D-1751.

Concrete shall be cured using the curing compound method for curb, sidewalks, and gutters. The curing compound shall be the clear or translucent type conforming to the specifications of AASHTO Designation: M148, Type 1, except that the loss of water in the water retention test shall not exceed 0.040 gram per square centimeter or surface. The curing compound shall contain a fugitive dye and shall be applied at the approximate rate of one (1) gallon per one hundred fifty (150) square feet of area. The curing compound shall be applied in a manner that will provide a complete coating of all exposed faces of the concrete surface. Alternate curing methods shall be submitted to the Engineer for approval before use.

Reinforcing steel, where required, shall conform to Section 52, "Reinforcement", of the Caltrans Specifications and these Special Provisions. All rebar shall be Grade 60.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals for concrete sidewalks, including ramps, including all grading necessary for installation of concrete sidewalk or concrete ramps, to finished grade, disposal of all excess material, all sawcuts, reinforcements where required, grading under concrete, providing and grading aggregate base subbase, backfill, compaction, watering, expansion joint filler, concrete and curing compound, and for doing all the work involved in furnishing and placing concrete sidewalks, or ramps, complete in place, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer shall be included in the prices paid for the contract items of work involved, and no additional work compensation will be allowed therefor. Where sidewalk, or driveway is adjacent to curb or curb and gutter, the six (6) inch dimension from face of curb to back of curb shall not be counted.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals for concrete curb and gutter, including all aggregate subbase, reinforcement, sawcuttings, backfill, compaction, watering, expansion joint filler, reinforcing steel, concrete, and concrete curing compound, and for doing all the work involved in furnishing and placing concrete curb and gutter, complete in place, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer shall be included in the prices paid for the various contract of work involved, and no additional work compensation will be allowed therefor.

Broken pieces of concrete shall be immediately removed from the job site and disposed. No portions of broken concrete shall remain on the job site overnight. Contractor shall pay to the City of Stockton the sum of Two Hundred Fifty Dollars (\$250) for every calendar day where debris has remained on the job site overnight.

73-1.02 DETECTABLE WARNING SURFACE

The Contractor shall retrofit existing concrete curb ramps with detectable warning surface (truncated dome panel) in accordance with the construction details on plans, Caltrans Specifications Section 73 and these Special Provision. The color of the detectable warning surface is preferred to be yellow conforming to Federal Standard 595, color number 33538, or similar. Other colors may be accepted, only if approved by the Engineer.

Truncated dome shall be cast-in-place and embedded in the concrete or surface mounted. If the Contractor wants to use other method, he/she shall request to the Engineer for "approved equal" method at least fifteen (15) days before commencement of the project. The decision of the Engineer to approve or disapprove the method will be final.

The manufacturer shall provide a five-year material and labor warranty for prefabricated detectable warning surfaces guaranteeing removal and replacement in full, when there is a defect in the dome shape, color, fastness, sound-on-cane acoustic quality, resilience, or attachment. The warranty shall also include damage due to cracking, chipping and/or imperfect installation, including but not limited to, air pockets under the tiles. The warranty period shall begin on the date of acceptance of the project.

Full compensation for furnishing all labor, materials, tools equipment, and incidentals as required and doing all work involved in installing truncated domes, complete in place, will be considered as included in the contract unit price paid for "Install Truncated Domes on New Concrete ADA Ramp", and no additional compensation shall be allowed therefore.

Full compensation for furnishing all labor, materials, tools equipment, and incidentals as required and doing all work involved in installing truncated domes, complete in place, will be considered as included in the contract unit price paid for "Install Truncated Domes on Existing Concrete ADA Ramp", and no additional compensation shall be allowed therefore.

SECTION 74- BLANK

SECTION 75 – MISCELLANEOUS METALS

75-1.01 MISCELLANEOUS IRON AND STEEL

This work shall consist of furnishing and installing metal frames and covers or frames and grates for use in minor structures and shall conform to the provisions in Section 75, "Miscellaneous Metal", of the Standard Specifications.

Full compensation for furnishing and installing miscellaneous iron and steel, including metal frames and covers or frames and grates, shall be considered as included in the contract prices paid for the various contract items, and no additional compensation will be allowed therefore.

75-1.02 BOLLARDS

Bollards shall be in accordance with the plans, provisions of Section 75, "Miscellaneous Metal," of the Caltrans Standard Specifications and these Special Provisions.

Removable Bollard: The bollard post shall be constructed of 6" x 3" x 3/8" steel tubing, the lock and hinge pin shall be constructed of stainless steel.

In the collapse position the bollard shall have a maximum clearance of 5 inches.

1. Full compensation for furnishing all labor, materials, tools, equipment, and incidentals for furnishing and installing bollards, including excavation, drain rock, rebar, concrete, and for doing all the work involved in furnishing and installing bollards, complete in place, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer shall be included in the contract unit prices paid for, "Install Removable Bollard" and no additional work compensation will be allowed therefor.

SECTIONS 76-78 BLANK

SECTION 79 – SANITARY SEWER SYSTEM AND WATER MAIN SYSTEM

79-1.01 REDUCED PRESSURE BACKFLOW PREVENTER (RPBFP)

Reduced Pressure Backflow Preventers shall be as shown on the plans and conform to these special provisions and Calwater Service Company Standard Specifications.

Acceptable manufactures for RPBFP's shall be per the Calwater approved list of manufacturers.

79-2.01 INSTALLATION

Installation: The installation of RPBFP's shall be in accordance with the project plans and specifications and the manufacturer's requirements.

Connections and Layouts: shall conform to Calwater Service Company Standard Specifications

79-2.04 FIELD QUALITY CONTROL

Request inspection prior to and immediately after installing RPBFPP.

If tests indicate Work does not meet specified requirements, remove Work, replace, correct and retest at no cost to Owner.

79-2.05 PAYMENT

Full compensation for furnishing all labor, materials, tools equipment, and incidentals including excavating, bedding, backfilling, providing and installing appurtenances, pipe and fittings as required and doing all work involved in installing various sizes of reduced pressure backflow preventers, complete in place, will be considered as included in the contract unit price paid for in furnishing and placing each size and type of reduced pressure backflow preventer, and no additional compensation shall be allowed therefore.

SECTIONS 80-83 BLANK

DIVISION IX – TRAFFIC CONTROL DEVICES

SECTION 84 – MARKINGS

84-1.01 TRAFFIC STRIPES, PAINTED CURBS, PAVEMENT MARKINGS & MARKERS

Contractor shall be responsible for repairing and replacing Contractor-damaged traffic stripes and pavement legends, including crosswalks per the California MUTCD and Sections 84, "Markings", and 81-3, "Pavement Markers", of the Caltrans Specifications, as modified herein, and as directed by the Engineer. All pavement traffic stripes, legends, arrows and crosswalks shall be installed with hot applied thermoplastic pavement material.

The thermoplastic material shall be free of lead and chromium and conform to State Specification PTH-02ALKYD (for markings) and PTH-02SPRAY (for stripes). Thermoplastic material shall be applied to the pavement at a minimum thickness of 0.060 inches for long lines (4 inches stripes and 8 inches stripes in width) and 0.100 inches for all legends and arrows. The crosswalk lines and limit lines shall be installed at a minimum thickness of 0.125 inches.

A double extruded thermoplastic traffic stripe consisting of two 4-inch wide yellow stripes is measured as 2 traffic stripes.

A double sprayable thermoplastic traffic stripe consisting of two 4-inch wide yellow stripes is measured as 1 traffic stripe.

If the contractor chooses to install stripes by using a cart (extruded) rather than a striping vehicle, all striping shall be applied to the pavement at a minimum thickness of 0.090 inches. Glass beads shall conform to Sections 84-2.02D, 84-2.02E, and 84-2.03C(e). Thermoplastic pavement markings and stripes shall be free of runs, bubbles, craters, drag marks, stretch marks, and debris.

Use appropriate installation procedures according to manufacturer. If pavement markings are applied to existing surface over existing painted legends (arrows and crosswalks), existing pavement legends (arrows and crosswalks) shall be removed before thermoplastic material is applied. For either material, pavement shall be preheated to remove all residual moisture prior to installation.

Configuration of traffic stripes, pavement markings, and crosswalks shall conform to the detail and methods as set forth in the latest issue of the State of California MUTCD and Caltrans Specifications, unless specifically modified on the plans.

All existing traffic stripes and pavement markings shall be removed where shown on the plans, where the existing striping conflicts with proposed striping, and as designated by the Engineer.

Existing pavement markers, including underlying adhesive, when no longer required for traffic lane delineation, as directed by the Engineer, shall be removed and disposed of.

Removal of traffic stripes and pavement markings, shall conform to Section 84-9.03B, "Remove Traffic Striped and Pavement Markings" of the Caltrans Standard Specifications. The removal of yellow paint and thermoplastic material shall also

conform to the provisions in Section 14-11.12 "Removal of Yellow Traffic Stripe and Pavement Marking with Hazardous Waste Residue" of the Caltrans Standard Specifications.

The Contractor shall place control points for the Engineer to review and approve. No additional "cat tracks" shall be placed until control points are approved by the Engineer. The Contractor shall obtain approval from the Engineer on all striping cat tracks prior to final application and striping and markers.

The Contractor shall place and remove any temporary striping required for routing traffic through the project area.

All thermoplastic shall be provided by the Contractor. Manufacturer and specifications shall be submitted for approval and shall conform to the specifications contained herein. All thermoplastic supplied shall conform to the local air pollution regulations. Traffic line markings shall be reflectorized and shall conform to the Caltrans Specifications, Section 84-2, "Thermoplastic Traffic Stripes and Pavement Markings".

Existing surface which is to receive the thermoplastic material shall be mechanically wire brushed to remove all dirt and contaminants. Thermoplastic material shall be applied only to the dry pavement surfaces and only when the pavement surface temperature is above fifty (50°F) degrees Fahrenheit. Thermoplastic shall be applied only on a thoroughly dry surface and during periods of favorable weather.

The Contractor shall make all necessary conform striping as required. The completed stripes and markings shall be sharp and clear with clean, well-defined edges.

Any damage by the elements to a new stripe or marking due to the failure of any Contractor to protect his work shall be repaired by him at no additional cost. Any over-spray or tracking of fresh thermoplastic material onto unpainted surfacing shall be removed by any methods to the satisfaction of the Engineer.

DIVISION XI – MATERIALS

SECTION 88 - GEOSYNTHETICS

88-1.01 PAVING GRID

Paving grid shall be in accordance with the provisions of Section 96-1.02L, "Paving Grid," of the Caltrans Standard Specifications and these Special Provisions.

Paving grid for this project shall be Class III and shall be installed per manufacture's recommendations and as shown on the plans.

Payment for supplying, placing paving grid shall be included in the various items of work, and no additional compensation will be allowed therefore.

SECTION 90 - CONCRETE

Attention is directed to the Section 90, "Concrete" of the Standard Specifications and these Special Provisions.

90-1.01 MINOR CONCRETE

Section 90-2, "Minor Concrete", of the Caltrans Specifications is amended by adding the following:

Mineral admixture will be required in the manufacture of concrete containing aggregate that is determined to be "deleterious" or "potentially deleterious" when tested in accordance with ASTM Designation: C 289. The use of mineral admixture in such concrete shall conform to the requirements in Section 90-1.02 of the Caltrans Specifications, "Materials", except the use of Class C mineral admixture will not be permitted.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all work involved in placing minor concrete shall be including in the various item of work involving minor concrete work.

90-1.02 CONTROLLED LOW STRENGTH MATERIAL (CLSM)

Controlled low-strength material (CLSM) is a low strength- and high slump- self compacted, cementitious material used primarily as backfill in lieu of compacted fill. CLSM shall be a mixture of Portland cement, fly ash or other approved materials, aggregates, water and admixtures proportioned to provide a non-segregating, self-consolidating, free-flowing and excavatable material, which will result in a hardened, dense, non-settling fill. CLSM shall be used as a consolidated fill material in abandoned areas, and at other locations where consolidated, non-settling backfill is required to prevent settlement. CLSM may be used in lieu of conventional backfill as approved by engineer.

Except as otherwise indicated, the current editions of the following standards apply to this Section:

1. ASTM C 150 Specification for Portland Cement
2. ASTM C 618 Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
3. ASTM C 666 Test Method for Resistance of Concrete to Rapid Freezing and Thawing
4. ASTM D 2434 Test Method for Permeability of Granular Solis (Constant Head)
5. ASTM D 4318 Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
6. ASTM D 4832 Test Method for Preparation and Testing of Controlled Low Strength Testing Materials (CLSM) Test Cylinders.
7. ASTM D 5971 Practice for Sampling Freshly Mixed Controlled Low Strength Material (formerly PS-30)
8. ASTM D 6023 Test Method for Unit Weight, Yield, Cement Content and Air Content (Gravimetric) of Controlled Low Strength Material (formerly PS-29)
9. ASTM D 6024 Test Method for Ball Drop on Controlled Low Strength Material (CLSM) to Determine Suitability for Load Application (formerly PS- 31)
10. ASTM D 6103 Test Method for Flow Consistency of Controlled Low Strength Material (formerly PS-28)
11. ACI Committee 229R, 2005 Controlled Low-Strength Material.

Use skilled workers who are thoroughly trained and experienced in the necessary crafts and who are familiar with the specified requirements and the methods needed.

Submittals of CLSM shall be the following:

At least 28 days before the beginning of CLSM placement, submit the following items for review and approval:

1. List of proposed materials to be provided under this Section.
2. Manufacturer's specifications, catalog cuts. And other engineering data needed to demonstrate compliance with the specified requirements.
3. The CLSM mix design, prepared by the manufacturer, showing compliance with the specified properties.
4. Written evidence of approval of the certified producer/supplier by the manufacturer.

CLSM shall consist of a mixture of Portland cement, aggregate, fly ash, water, and approved admixtures conforming to the following requirements:

1. Portland Cement: ASTM C 150, Type II/V.

- a. Aggregate: Clean imported sand and gravel or selected material from the excavation, imported material, or a combination thereof as approved by the Engineer. Maximum aggregate size shall be 1 to 3 inches. The soluble sulfate content of aggregate in the mixture shall not exceed 0.3 percent by dry weight.
 - b. Water: Potable quality.
 - c. Fly Ash: Class C, ASTM C 618 or approved alternate.
 - d. The minus 200 sieve fraction shall be non-plastic, as defined by ASTM D4318. By this standard, a soil is considered non-plastic if either the liquid or plastic limit cannot be determined, or if the plastic limit is equal to or greater than the liquid limit.
2. Proportion CLSM to be a flowable, non-segregating, self-consolidating low-shrink slurry. COS shall determine the materials and proportions used to meet the requirements of these Specifications.
 3. CLSM shall have a cast density of 120 pcf minimum. The unconfined compressive strength at 7 days shall be a minimum of 100 psi and a maximum of 200 psi. Compressive strength at 28 days shall be 150 psi minimum and 250 psi maximum. Contractor shall cast a minimum of six test cylinders with approved mixture to confirm design strength and mix design. Three of the cylinders shall be broken at 7 days in conformance with applicable concrete cylinder specifications and results provided to the Engineer. Two cylinders shall be broken at 28 days to confirm strength. The remaining cylinder shall be broken by SPJV at discretion of the Engineer. Initial mix design and cylinder breaks shall be completed at least 21 days prior to use of the material on the jobsite. Final mix approval and use of the material shall not occur prior to confirmation of strength by the cylinder breaks.
 4. The temperature of the CLSM discharged into the trench shall be below 90 degrees F.

Test in accordance with ASTM C 495.

Installation of CLSM shall conform with the following:

Items encased within the fill shall be properly set and stable prior to the installation of the CLSM.

Do not place at air temperatures of less than 32 degrees Fahrenheit, nor when freezing air temperatures are expected to occur within 24 hours of placement.

Use only the automated job site proportioning, mixing, and placing equipment certified by the product manufacturer or ready-mix supplier. Mix the materials according to the mix design, and convey them promptly to the location of final placement.

Minimize agitation, lateral flow, and any free fall drop height in delivery, placement, or handling of the CLSM.

Place CLSM in lifts not exceeding 3 ft thick unless otherwise recommended by the manufacturer.

Neither foot traffic, equipment traffic, backfilling, nor any other operations on the CLSM shall be permitted until the material has attained a compressive strength of at least 20 psi.

Deliver CLSM to the trench in ready mix trucks and utilize pump or chutes to place the CLSM in the trench. Direct CLSM to one side of the pipe, taking care not to displace the pipe at any time. Continue placing CLSM on one side of the pipe until CLSM has gone under the pipe and up the other side to a depth of 1.5 feet above the pipe bottom.

Maintain stability of pipe throughout CLSM placement using lifts to prevent pipe flotation. No movement of the pipe caused by flotation will be allowed. If any movement occurs, CLSM shall be removed and the pipe placed back on line and grade. Any damage to the pipeline system caused by movement of the pipe shall be removed and/or repaired at no additional cost to the SVCW. Remove all sloughed material or other debris from top of previously placed CLSM.

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MCKINLEY PARK AND POOL RENOVATION**

SPECIAL PROVISION

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SECTION 01 57 23

STORM WATER POLLUTION PREVENTION

PART 1 - GENERAL

1.1 APPLICABILITY

- A. Construction projects resulting in land disturbance of one acre or more: Contractor shall apply for coverage under the Construction General Permit, Waste Discharge Requirements Order No. 2009- 0009-DWQ (As amended by 2010-0014-DWQ and 2012-0006-DWQ), National Pollution Discharge Elimination System (NPDES) Permit No. NPDES (SW-2016NPDES-R5-2016-0040 (MS4 Permit), prior to commencement of construction activities. The document is available from the State Water Resources Control Board website at http://www.swrcb.ca.gov/water_issues/programs/stormwater/constpermits.shtml

1.2 SCOPE

- A. Discharge of pollutants (any substance, material, or waste other than clear, uncontaminated storm water) from the project into the storm drain system is strictly prohibited by the Central Valley Regional Water Quality Control Board's (RWQCB) Water Quality Control Plan (Basin Plan).
- B. Provide all material, labor, equipment for installation, implementation, and maintenance of all surface-water pollution prevention measures and dust control measures. This work includes the following:
1. Provide, place, and install effective measures for preventing runoff of soil, silts, gravel, hazardous chemicals or other materials prohibited by the Central Valley RWQCB from entering the storm water drainage system.
 2. Management of on-site construction materials in such a manner as to prevent said materials from contacting storm water or wash water and running off into the storm drain system.
 3. Complying with applicable standards and regulations specified herein.
 4. Maintain the most current revised Storm Water Pollution Prevention Plan (SWPPP) at the Contractor's work site. Three hard copies and an electronic copy of the original and each revision shall be forwarded to the City's Representative.
 5. Review any changes in the SWPPP plan each week at the weekly meetings with City's Representative and others. At each weekly meeting, the Contractor shall submit a numbered checklist of the current status of each prevention measure on the job site.

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6. Provide dust control in accordance with San Joaquin Valley Air Pollution Control District requirements.
- C. In this section, the term "storm drain system" shall include storm water conduits, storm drain inlets and other storm drain structures, street gutters, channels, ditches, and the Arboretum waterway.
- D. Sanitary sewer discharge regulations are intended to provide protection of the sanitary sewer system. In this section, "sanitary sewer" shall include any sanitary sewer manhole, clean out, sewer laterals.
- E. Contractor shall have storm water pollution prevention measures in place and conduct inspections year-round. It is the responsibility of the Contractor to be prepared for a rain event in the non-rainy season, and to be aware of weather predictions. The City is not responsible for informing the Contractor of rain predictions.
- F. Sanitary sewer blockages can result in a back-up and discharge to the storm drain system. Contractor shall immediately notify the City's Representative if they become aware of a clogged sanitary sewer associated with the project.
- G. Contractor shall not allow any non-storm water from the project to enter the storm drain system. Examples of non-storm water include water used for dust suppression, pipe flushing and testing, and domestic supply water used to wash streets, painting and drywall equipment, vehicles, or other uses.
- H. Water resulting from de-watering an excavation may be discharged to a storm drain only if it is free of pollutants, including sediment. Contractor shall use methods such as a settling basin or filter to ensure that dewatering discharges are free of pollutants.

1.3 REGULATIONS AND STANDARDS

- A. Contractor shall comply with the following applicable regulations:
 1. Clean Water Act, United States Environmental Protection Agency, and Porter-Cologne Clean Water Act, State of California.
 2. Central Valley Basin (Region 5) Water Quality Control Plan (Basin Plan), California Regional Water Quality Control Board, 1998 Edition including revisions.
 3. Construction General Permit, Waste Discharge Requirements Order No. 2009-0009 DWQ (As amended by 2010-0014-DWQ and 2012-0006-DWQ), National Pollutant Discharge Elimination System (NPDES) Permit No. NPDES (SW-2016NPDES-R5-2016-0040 (MS4 Permit). This Order is referred to as the Construction General Permit (CGP).
- B. Contractor shall comply with the following standards and guidelines on storm water pollution prevention:

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1. California Stormwater Quality Association (CASQA) - Construction BMP Handbook Portal. This document is available for a fee from the CASQA website at <http://www.casqa.org/>
- C. Contractor shall comply with the following applicable regulations on dust control:
 1. San Joaquin Valley Air Pollution Control District, Regulation VIII, Rule 8021 – Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities. <https://www.valleyair.org>

1.4 RELATED REQUIREMENTS

- A. Section 32 84 00 Landscape Irrigation
- B. Section 32 93 00 Planting

1.5 QUALITY ASSURANCE

- A. Storm Water Pollution Prevention Plan (SWPPP) shall be prepared and certified by a Qualified SWPPP Developer (QSD). A Construction Site Monitoring Program (CSMP) shall be part of the SWPPP and included as an appendix or separate SWPPP chapter.
- B. Qualified SWPPP Practitioner (QSP) shall oversee the implementation of all BMPs, monitoring, inspections and reports required by the Construction General Permit. Effective September 1, 2011, a QSP shall be either a QSD or have one of the following certifications:
 1. A certified erosion, sediment and storm water inspector (CESSWI) registered through Enviro Cert International, Inc.; or,
 2. A certified inspector of sediment and erosion control (CISEC) registered through Certified Inspector of Sediment and Erosion Control, Inc.
 3. Effective September 1, 2011, both QSDs and QSPs shall have attended a State Water Board sponsored or approved QSD/QSP training course and pass the State proctored exam. A current list of certified QSD/QSPs is available from the CASQA website at: <http://www.casqa.org/>

1.6 SUBMITTALS

- A. Submittals shall comply with requirements specified in Section 01 33 23 Shop Drawings, Product Data and Samples. All submittals listed below shall be submitted to the City's Representative 45 days prior to groundbreaking to allow for review and acceptance by the City. No sitework may occur prior to review and certification of the submittals.
- B. Construction projects resulting in land disturbance of one acre or more shall submit Permit Registration Documents (PRDs). PRDs shall be electronically

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submitted 21 days prior to commencement of construction activity using the State Water Resources Control Board's Storm Water Multi-Application Report Tracking System (SMARTS) at

<http://smarts.waterboards.ca.gov/smarts/faces/SwSmartsLogin>.

Contractor must register as a Legally Responsible Person (LRP) in SMARTS and provide their user ID# to the City's Representative prior to uploading PRDs. The following information shall be submitted and must be deemed complete by SMARTS, before a WDID number will be issued confirming coverage under the General Construction Permit.

C. Initial Permit Registration Documents (PRDs):

1. Notice of Intent (NOI)
2. Risk Assessment (Construction Site Sediment and Receiving Water Risk Determination) The Contractor shall comply with additional permit requirements which are based on the outcome of the construction project risk determination. These requirements are outlined in the Construction General Permit (CGP).
 - a. Risk Level 1 Requirements - CGP (Attachment C)
 - b. Risk Level 2 Requirements - CGP (Attachment D)
 - c. Risk Level 3 Requirements - CGP (Attachment E)
3. Site Map-
 - a. The project's surrounding area (vicinity)
 - b. Site layout
 - c. Construction site boundaries
 - d. Drainage areas
 - e. Discharge locations
 - f. Sampling locations
 - g. Areas of soil disturbances (temporary or permanent)
 - h. Active areas of soil disturbances (cut and fill)
 - i. Locations of all runoff Best Management Practices (BMPs)
 - j. Locations of all erosion control BMPs
 - k. Locations of all sediment control BMPs
 - l. Active Treatment System (ATS) location (if applicable)
 - m. Locations of sensitive habitats, watercourses, or other features which

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are not to be disturbed

- n. Locations of all post-construction BMPs
 - o. Locations of storage areas for waste, vehicles, service, loading/unloading of materials, access (entrances/exits) points to construction site, fueling, and water storage, water transfer for dust control and compaction practices
4. Storm Water Pollution Prevention Plan (SWPPP) including a Construction Site Monitoring Program (CSMP) shall be certified by a Qualified SWPPP Developer (QSD) and shall meet the minimum criteria using the SWPPP template in Section 2, Appendix B of the CASQA - Construction BMP Handbook Portal. This template is available from the CASQA website for a fee at <http://www.casqa.org/>. The SWPPP must contain all required elements specified in the Construction General Permit. The SWPPP shall be designed, developed and revised as necessary, and signed by the QSD to meet the following objectives:
- a. All pollutants and their sources, including sources of sediment associated with construction, construction site erosion and all other activities associated with construction activity are controlled
 - b. All non-storm water discharges must be identified and either eliminated, controlled or treated.
 - c. Site Best Management Practices (BMPs) are effective and result in the reduction or elimination of pollutants in storm water discharges and authorized non-storm water discharges from construction activity using Best Available Technologies Economically Achievable (BAT) and Best Conventional Pollutant Control Technologies (BCT).
 - d. Design details as well as BMP controls for site run-on must be complete and correct
 - e. Stabilization BMPs installed to reduce or eliminate pollutants after construction is complete.
 - f. The Qualified SWPPP Developer (QSD) shall include information in the SWPPP that supports the conclusions, selections, use and maintenance of BMPs.
 - g. The SWPPP shall be available at the construction site during working hours while construction is occurring and shall be made available upon request by a State Inspector.
5. Contractor shall secure the Annual Permit Fee which is payable to the SWRCB.

D. Additional PRD Requirements:

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1. The Annual Report is due by August 15th of each year, or prior to submittal of a Notice of Termination (NOT). The reporting period is July 1st to June 30th.
 - a. Submittal of the report is completed by filling out the Annual Report form in the SMARTS on-line reporting system.
2. Notice of Termination (NOT) required within 90 days of when construction is complete and shall include electronic photo(s) representative of the site showing final stabilization. The NOT must demonstrate that final stabilization is attained by one of the following methods as outline in the Construction General Permit.
 - a. 70% final cover method
 - b. RUSLE or RUSLE 2 method
 - c. Custom method
3. Site work shall not commence until the initial Permit Registration Documents (PRDs) have been electronically submitted to the State Water Resources Control Board's Storm Water Multi-Application Report Tracking System (SMARTS) and a WDID number has been issued to confirm coverage under the Construction General Permit. PRDs will be reviewed and certified by the City.

1.7 TRAINING REQUIREMENTS

- A. Qualified SWPPP Developer (QSD) shall write, amend and certify SWPPPs. A QSD shall have one of the following registrations or certifications, and appropriate experience, as required for:
 1. A California registered professional civil engineer
 2. A California registered professional geologist or engineering geologist
 3. A California registered landscape architect
 4. A professional hydrologist registered through the American Institute of Hydrology
 5. A Certified Professional in Erosion and Sediment Control (CPESC) registered through Enviro- Cert International, Inc.
 6. A Certified Professional in Storm Water Quality (CPSWQ) registered through Enviro Cert International, Inc.
 7. A professional in erosion and sediment control registered through the National Institute for Certification in Engineering Technologies (NICET)
- B. Qualified SWPPP Practitioner (QSP) shall implement all BMPs required by the General Construction Permit. Effective September 1, 2011, a QSP shall be either a QSD or have one of the following certifications:

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1. A certified erosion, sediment and storm water inspector (CESSWI) registered through Enviro Cert International, Inc.; or,
 2. A certified inspector of sediment and erosion control (CISEC) registered through Certified Inspector of Sediment and Erosion Control, Inc.
- C. Effective September 1, 2011, both QSDs and QSPs shall have attended a State Water Board sponsored or approved QSD/QSP training course and pass the State proctored exam.

1.8 DUST CONTROL

- A. Contractor shall prepare and submit a Dust Control Plan to the San Joaquin Valley Air Pollution Control District. The Contractor shall obtain approval at least 30 days prior to commencement of construction activities, and the Contractor shall pay all applicable fees.
- B. The Contractor's plan preparer for the Dust Control Plan is required to complete a training class with the San Joaquin Valley Air Pollution Control District. The training schedule is available at this website:

http://www.valleyair.org/busind/comply/PM10/forms/ReqVIII_training_schedule.pdf

PART 2 - PRODUCTS

2.1 MATERIAL

- A. General: Provide materials as required for execution of the work.

PART 3 - EXECUTION

3.1 GENERAL

- A. The Contractor shall ensure a Qualified SWPPP Developer (QSD) will write and amend the SWPPP that includes a site map and written description of pollution prevention methods. The intent of this requirement is to ensure Contractor compliance with applicable regulations for the discharge of storm water from the project. The Contractor will choose the best available performance-based technology and methods to prevent storm water pollution for construction site activity. The method(s) chosen shall be appropriate for each specific site condition.

3.2 SWPPP TOPICS

- A. Following are topics the Contractor shall address in the SWPPP:

SWPPP Certification By Qualified SWPPP Developer
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(QSD)
Section 1 SWPPP Requirements
1.1 Introduction
1.2 Permit Registration Documents (PDRs)
1.3 SWPPP Availability and Implementation
1.4 SWPPP Amendments
1.5 Retention of Records
1.6 Required Non-Compliance Reporting
1.7 Annual Report
1.8 Changes to Permit Coverage
1.9 Notice of Termination

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Section 2 Project Information
1.10 Project and Site Description
1.11 Stormwater Run-On From Offsite Areas
1.12 Findings of the Construction Site Sediment and Receiving Water Risk Determination
1.13 Construction Schedule
1.14 Potential Construction Site Pollutant Sources
1.15 Identification of Non-Stormwater Discharges
Section 3 Best Management Practices (BMPs)
3.1 Schedule for BMP Implementation
3.2 Erosion Control and Sediment Control
3.3 Non-Stormwater and Material Management
3.4 Post-Construction Stormwater Management Measures
Section 4 BMP Inspection, Maintenance, and Rain Event Action Plans
4.1 BMP Inspection and Maintenance
4.2 Rain Event Action Plans
Section 5 Training
Section 6 Responsible parties and Operators
6.1 Responsible Parties
6.2 Contractor List
Section 7 Construction Site Monitoring Program
7.1 Purpose
7.2 Applicability of Permit Requirements
7.3 Monitoring Locations
7.4 Safety
7.5 Visual Monitoring (Inspections)
7.6 Water Quality Sampling and Analysis
7.7 Watershed Monitoring Option
7.8 Quality Assurance and Quality Control
7.9 Reporting Requirements and Records Retention

B. The Contractor shall insure a Qualified SWPPP Practitioner (QSP) will oversee

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the implementation of the SWPPP, Construction Site Monitoring Program (CSMP), BMPs, monitoring, inspections and reporting. Inspections shall be performed weekly, pre-storm, post-storm and at least once each 24- hour period during qualifying storm events. Non-storm water discharge observations shall be performed quarterly. A qualifying storm event has a 50% or greater probability of precipitation. The CGP requires that dischargers only use the National Oceanographic and Atmospheric Administration (NOAA) weather forecasts to predict qualifying storm events. The NOAA website is located at: <http://www.srh.noaa.gov/>. Repairs and design changes to BMPs shall be implemented within 72 hours of identification. For each inspection required complete the Inspection Checklist using the template in Appendix D -Field Monitoring and Analysis Guidance of the CASQA - Construction BMP Handbook Portal. The template is available from the CASQA website for a fee at <http://www.casqa.org>

1. Inspection Checklist - The checklist at a minimum shall include:
 - a. Inspection date and date inspection report was written
 - b. Weather information, including duration of rain event, time elapsed since last storm, approximate amount of rainfall
 - c. Site information including state of construction, activities completed, and approximate area of the site exposed
 - d. A description of any BMPs evaluated and any deficiencies noted
 - e. If construction site is safely accessible during inclement weather, list the observations of all BMPs, or list the results of visual inspections of all relevant outfalls, discharge points, downstream locations and any projected maintenance activities
 - f. Report presence of noticeable odors, or visible sheen on the surface of any discharges
 - g. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates
 - h. Photographs taken during the inspection, if any
 - i. Inspector's name, title and signature

- C. Retention of Records - All required storm water records must be maintained by the discharger for 3 years from the date the Notice of Termination (NOT) was approved by the RWQCCB. Contractor shall provide copies of stormwater documents, inspections and reports to the City's Representative at project completion.

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3.3 ENVIRONMENTAL ENFORCEMENT

- A. The Central Valley RWQCB has authority to enforce, through codified regulations, any portions of this Section that may violate applicable regulations. Agency enforcement may include but is not limited to: citations, orders to abate, bills for cleanup costs and administration, civil suits, and criminal charges. Contract compliance action by the City shall not be construed to void or suspend any enforcement actions by these or other regulatory agencies.
- B. Contractor shall notify the City's Representative within 24 hours after issuance of any citation(s) issued by any regulatory agency and shall be responsible for all fines and costs necessary to correct the conditions listed in the citation(s) to include all legal fees and City expenses.

3.4 PERFORMANCE

- A. Remove and recycle excess material as required by the Construction Waste Management Plan, Section 01 74 19 – CONSTRUCTION WASTE MANAGEMENT.

3.5 NOTICE OF TERMINATION

- A. The Contractor shall be responsible for filing and obtaining the NOT within 90 days of when construction is complete. Prior to filing the NOT, the Contractor shall demonstrate to the satisfaction of the City's Representative that final stabilization has been achieved. Final stabilization shall include planting establishment of the bioretention areas. Irrigation of the bioretention areas shall be completed by hand, as necessary, to achieve planting establishment. Refer to Section 32 84 00 Landscape Irrigation, and Section 32 93 00 Planting, for additional requirements.

END OF SECTION 01 57 23

**SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT**

PART 1 – GENERAL

1.1 DESCRIPTION

- A. This section specifies the requirements for the management of non-hazardous building construction and demolition waste.
- B. Waste disposal in landfills shall be minimized to the greatest extent possible. Of the inevitable waste that is generated, as much of the waste material as economically feasible shall be salvaged, recycled or reused.
- C. Contractor shall use all reasonable means to divert construction and demolition waste from landfills and incinerators, and facilitate their salvage and recycle not limited to the following:
 - 1. Waste Management Plan development and implementation.
 - 2. Techniques to minimize waste generation.
 - 3. Sorting and separating of waste materials.
 - 4. Salvage of existing materials and items for reuse or resale.
 - 5. Recycling of materials that cannot be reused or sold.
- D. At a minimum the following waste categories shall be diverted from landfills:
 - 1. Soil.
 - 2. Inerts (eg, concrete, masonry and asphalt).
 - 3. Clean dimensional wood and palette wood.
 - 4. Green waste (biodegradable landscaping materials).
 - 5. Engineered wood products (plywood, particle board and I-joists, etc).
 - 6. Metal products (eg, steel, wire, beverage containers, copper, etc).
 - 7. Cardboard, paper and packaging.
 - 8. Bitumen roofing materials.
 - 9. Plastics (eg, ABS, PVC).
 - 10. Carpet and/or pad.
 - 11. Gypsum board.
 - 12. Insulation.
 - 13. Paint.
 - 14. Fluorescent lamps.

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1.2 QUALITY ASSURANCE

- A. Contractor shall practice efficient waste management when sizing, cutting and installing building products. Processes shall be employed to ensure the generation of as little waste as possible. Construction /Demolition waste includes products of the following:
 - 1. Excess or unusable construction materials.
 - 2. Packaging used for construction products.
 - 3. Poor planning and/or layout.
 - 4. Construction error.
 - 5. Over ordering.
 - 6. Weather damage.
 - 7. Contamination.
 - 8. Mishandling.
 - 9. Breakage.
- B. Establish and maintain the management of non-hazardous building construction and demolition waste set forth herein. Conduct a site assessment to estimate the types of materials that will be generated by demolition and construction.
- C. Contractor shall develop and implement procedures to recycle construction and demolition waste to a minimum of 50 percent.
- D. Contractor shall be responsible for implementation of any special programs involving rebates or similar incentives related to recycling. Any revenues or savings obtained from salvage or recycling shall accrue to the contractor.
- E. Contractor shall provide all demolition, removal and legal disposal of materials. Contractor shall ensure that facilities used for recycling, reuse and disposal shall be permitted for the intended use to the extent required by local, state, federal regulations. The Whole Building Design Guide website <http://www.cwm.wbdg.org> provides a Construction Waste Management Database that contains information on companies that haul, collect, and process recyclable debris from construction projects.
- F. Contractor shall assign a specific area to facilitate separation of materials for reuse, salvage, recycling, and return. Such areas are to be kept neat and clean and clearly marked in order to avoid contamination or mixing of materials.
- G. Contractor shall provide on-site instructions and supervision of separation, handling, salvaging, recycling, reuse and return methods to be used by all parties during waste generating stages.
- H. Record on daily reports any problems in complying with laws, regulations and ordinances with corrective action taken.

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1.3 TERMINOLOGY

- A. Class III Landfill: A landfill that accepts non-hazardous resources such as household, commercial and industrial waste resulting from construction, remodeling, repair and demolition operations.
- B. Clean: Untreated and unpainted; uncontaminated with adhesives, oils, solvents, mastics and like products.
- C. Construction and Demolition Waste: Includes all non-hazardous resources resulting from construction, remodeling, alterations, repair and demolition operations.
- D. Dismantle: The process of parting out a building in such a way as to preserve the usefulness of its materials and components.
- E. Disposal: Acceptance of solid wastes at a legally operating facility for the purpose of land filling (includes Class III landfills and inert fills).
- F. Inert Backfill Site: A location, other than inert fill or other disposal facility, to which inert materials are taken for the purpose of filling an excavation, shoring or other soil engineering operation.
- G. Inert Fill: A facility that can legally accept inert waste, such as asphalt and concrete exclusively for the purpose of disposal.
- H. Inert Solids/Inert Waste: Non-liquid solid resources including, but not limited to, soil and concrete that does not contain hazardous waste or soluble pollutants at concentrations in excess of water-quality objectives established by a regional water board, and does not contain significant quantities of decomposable solid resources.
- I. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.
- J. Mixed Debris Recycling Facility: A solid resource processing facility that accepts loads of mixed construction and demolition debris for the purpose of recovering re-usable and recyclable materials and disposing non-recyclable materials.
- K. Permitted Waste Hauler: A company that holds a valid permit to collect and transport solid wastes from individuals or businesses for the purpose of recycling or disposal.
- L. Recycling: The process of sorting, cleansing, treating, and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.
 - 1. On-site Recycling – Materials that are sorted and processed on site for use in an altered state in the work, i.e. concrete crushed for use as a sub-base in paving.
 - 2. Off-site Recycling – Materials hauled to a location and used in an altered form in the manufacture of new products.

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- M. Recycling Facility: An operation that can legally accept materials for the purpose of processing the materials into an altered form for the manufacture of new products. Depending on the types of materials accepted and operating procedures, a recycling facility may or may not be required to have a solid waste facilities permit or be regulated by the local enforcement agency.
- N. Reuse: Materials that are recovered for use in the same form, on-site or off-site.
- O. Return: To give back reusable items or unused products to vendors for credit.
- P. Salvage: To remove waste materials from the site for resale or re-use by a third party.
- Q. Source-Separated Materials: Materials that are sorted by type at the site for the purpose of reuse and recycling.
- R. Solid Waste: Materials that have been designated as non-recyclable and are discarded for the purposes of disposal.
- S. Transfer Station: A facility that can legally accept solid waste for the purpose of temporarily storing the materials for re-loading onto other trucks and transporting them to a landfill for disposal, or recovering some materials for re-use or recycling.

1.4 SUBMITTALS

- A. Prepare and submit to the Resident Engineer a written demolition debris management plan. The plan shall include, but not be limited to, the following information:
 - 1. Procedures to be used for debris management.
 - 2. Techniques to be used to minimize waste generation.
 - 3. Analysis of the estimated job site waste to be generated:
 - a. List of each material and quantity to be salvaged, reused, recycled.
 - b. List of each material and quantity proposed to be taken to a landfill.
 - 4. Detailed description of the Means/Methods to be used for material handling.
 - a. On site: Material separation, storage, protection where applicable.
 - b. Off site: Transportation means and destination. Include list of materials.
 - 1) Description of materials to be site-separated and self-hauled to designated facilities.
 - 2) Description of mixed materials to be collected by designated waste haulers and removed from the site.
 - c. The names and locations of mixed debris reuse and recycling facilities or sites.
 - d. The names and locations of trash disposal landfill facilities or sites.

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- e. Documentation that the facilities or sites are approved to receive the materials.
- B. Designated Manager responsible for instructing personnel, supervising, documenting and administer over meetings relevant to the Waste Management Plan.
- C. Monthly summary of construction and demolition debris diversion and disposal, quantifying all materials generated at the work site and disposed of or diverted from disposal through recycling.

1.6 RECORDS

Maintain records to document the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed by landfill or incineration.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. List of each material and quantity to be salvaged, recycled, reused.
- B. List of each material and quantity proposed to be taken to a landfill.
- C. Material tracking data: Receiving parties, dates removed, transportation costs, weight tickets, tipping fees, manifests, invoices, net total costs or savings.

PART 3 - EXECUTION

3.1 COLLECTION

- A. Provide all necessary containers, bins and storage areas to facilitate effective waste management.
- B. Clearly identify containers, bins and storage areas so that recyclable materials are separated from trash and can be transported to respective recycling facility for processing.
- C. Hazardous wastes shall be separated, stored, disposed of according to local, state, federal regulations.

3.2 DISPOSAL

- A. Contractor shall be responsible for transporting and disposing of materials that cannot be delivered to a source-separated or mixed materials recycling facility to a transfer station or disposal facility that can accept the materials in accordance with state and federal regulations.
- B. Construction or demolition materials with no practical reuse or that cannot be salvaged or recycled shall be disposed of at a landfill or incinerator.

3.3 REPORT

- A. With each application for progress payment, submit a summary of construction and demolition debris diversion and disposal including beginning and ending dates of period covered.

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- B. Quantify all materials diverted from landfill disposal through salvage or recycling during the period with the receiving parties, dates removed, transportation costs, weight tickets, manifests, invoices. Include the net total costs or savings for each salvaged or recycled material.
- C. Quantify all materials disposed of during the period with the receiving parties, dates removed, transportation costs, weight tickets, tipping fees, manifests, invoices. Include the net total costs for each disposal.

END SECTION 01 74 19

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SECTION 02 41 19

SELECTIVE SITE DEMOLITION & STRUCTURES DEMOLITION

PART 1 - GENERAL

1.1 SCOPE

- A. This section shall consist of all clearing, grubbing, stockpiling, and demolition and removal from site those items so indicated on the Drawings.

1.2 REVIEW

- A. Contractor shall review with City's Representative the exact limits of work and extent of materials to be removed.
 - 1. Examine site and structures and determine exact nature and status of structural elements and utilities prior to commencing demolition.
 - 2. City assumes no responsibility for actual condition of items or structures to be demolished.
 - 3. Prior to commencing the work, perform a site survey to identify existing areas of damage to adjacent building areas and other buildings.

1.3 SECTION REQUIREMENTS

- A. Demolished material shall be considered the property of the Contractor and shall be completely removed from the job site.
- B. Comply with EPA regulations and hauling and disposal regulations of authorities having jurisdiction
- C. Contractor Shall refer to report titled "ASBESTOS AND LEAD-CONTAINING PAINT SURVEY REPORT MCKINLEY PARK" By GEOCON CONSULTANTS, INC. dated, JUNE 9, 2021

1.4 STANDARDS

- A. All work shall conform to ANSI A10.6, Safety Requirements for Demolition Operations and to the codes and regulations of the City.
- B. Recommendation contained within report titled "ASBESTOS AND LEAD-CONTAINING PAINT SURVEY REPORT MCKINLEY PARK" By GEOCON CONSULTANTS, INC." dated, JUNE 9, 2021

1.5 SCHEDULE

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- A. Submit schedule indicating proposed methods and sequence of operations for selective demolition work for review prior to commencement of work. Include coordination for shut-off, capping, and continuation of utility services as required.
 - 1. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of adjacent building uses.
 - 2. Coordinate continued occupancy with adjacent building tenants.

PART 2 - EXECUTION

2.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance.

2.2 DEMOLITION OF STRUCTURES

- A. Provide a minimum of 72 hours advance notice of demolition activities.
- B. Protection: Provide temporary barricades and other forms of protection as required to protect general public from injury due to selective demolition work. Provide protective measures as required to provide free and safe passage of general public to and from occupied portions of building. Erect temporary covered passageways as required by authorities having jurisdiction.
- C. Environmental Controls: Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level. Comply with governing regulations pertaining to environmental protection.
- D. Utilities: Disconnect all utilities to structures to be demolished in the manner prescribed by the utility company.
- E. Selective Demolition: Perform selective demolition work in a systematic manner. Use methods required to complete work indicated on the drawings in accordance with demolition schedule and governing regulations. Conduct selective demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.
- F. Traffic: Do not close, block or otherwise obstruct streets, walks, or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- G. Extent: Demolish foundation walls and footings to a depth of not less than 12 inches below finish grade. Demolish and remove below-grade wood or metal construction. Break up below grade concrete slabs. Completely fill below-grade areas and voids resulting from demolition work. Provide fill

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consisting of approved earth, gravel or sand, free of trash and debris, stones over 6 inch diameter, roots or other organic matter.

- H. Clean-up: Remove debris, rubbish and other materials resulting from demolition operations from building site. Transport and legally dispose of materials off site.
- I. Damages: Promptly repair damages caused to adjacent facilities by demolition work at no cost to the City.
- J. Contractor Salvage: Items indicated to be removed but of salvageable value to the Contractor may be removed from structure as work progresses. Transport Contractor salvaged items from site as they are removed. Storage or sale of removed items on site will not be permitted.

2.3 STOCKPILING

- A. Existing asphaltic paving, aggregate base and concrete rubble shall be stripped and stockpiled for re-use as aggregate base beneath parking paving. Materials not conforming to requirements for aggregate base as defined in these Specifications shall be removed and properly disposed of off-site.

END OF SECTION 02 41 13

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SECTION 03 10 00

CONCRETE FORMING AND ACCESSORIES

PART 1 – GENERAL

- 1.1 SECTION INCLUDES
 - A. Formwork for cast-in place concrete, with shoring, bracing and anchorage. Openings for other work.
 - B. Form accessories.
 - C. Form stripping.

- 1.2 RELATED REQUIREMENTS
 - A. Section 03210 – Reinforcing Steel.
 - B. Section 03300 – Cast-in-place Concrete.

- 1.3 REFERENCE STANDARDS
 - A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials.
 - B. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute
 - C. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute
 - D. ACI 347 - Guide to Formwork for Concrete; American Concrete Institute.

- 1.4 DESIGN: Design, engineer and construct formwork, shoring and bracing to conform to design and code requirements; resultant concrete to conform to required shape, line and dimension.

- 1.5 QUALITY ASSURANCE
 - A. Perform work of this section in accordance with ACI 117, ACI 301, ACI 318 and ACI 347.
 - B. Maintain one copy of each installation standard on site throughout the duration of concrete work.

END OF SECTION 03 10 00

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SECTION 03 21 00

REINFORCEMENT BARS

PART 1 - GENERAL

- 1.1 Section Includes: This WORK shall consist of furnishing and placing reinforcing steel in accordance with these SPECIFICATIONS and in conformity with the project Drawings.
- 1.2 RELATED SECTIONS: The following is a list of SPECIFICATIONS which may be related to this section:
- A. Section 03300, Cast-in-place Concrete.
 - B. Section 04000, General Masonry Provisions.
- 1.3 REFERENCES: The following is a list of standards which may be referenced in this section:
- American Concrete Institute (ACI):
- A. ACI Detailing Manual.
 - B. 117, Specifications for Tolerance for Concrete Construction and Materials.
 - C. 318, Building Code Requirements for Structural Concrete.
- American Welding Society (AWS):
- E. D1.1/D1.1M, Structural Welding Code - Steel.
 - F. D1.4/D1.4M, Structural Welding Code - Reinforcing Steel.
 - G. D2.0, Welded Highway and Railway Bridges.
- ASTM International (ASTM):
- I. A82/A82M, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
 - J. A497/A497M, Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete.
 - K. A615, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 - L. A996/A996M, Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement.
 - M. A706/A706M, Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.
 - N. A767/A767M, Standard Specification for Zinc-coated (Galvanized) Steel Bars for Concrete Reinforcement.

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- O. A775/A775M, Standard Specification for Epoxy-coated Steel Reinforcing.
 - P. Concrete Reinforcing Steel Institute (CRSI):
 - Q. Manual of Standard Practice.
 - R. Placing Reinforcing Bars.
- 1.4 SUBMITTALS: Two copies of a list of all reinforcing steel and bending diagrams shall be furnished to the Engineer at the site of the work at least one week before the placing of reinforcing steel is begun. Such lists will not be reviewed for accuracy. The Contractor shall be responsible for the accuracy of the lists and for furnishing and placing all reinforcing steel in accordance with the details shown on the plans.
- 1.5 DELIVERY, STORAGE, AND PROTECTION: Reinforcing steel shall be stored off of the ground and protected from oil or other materials detrimental to the steel or bonding capability of the reinforcing bar. Epoxy- coated reinforcing bars shall be stored on protective cribbing.

PART 2 - PRODUCTS

2.1 REINFORCING STEEL

Deformed Bars: All bar steel reinforcement shall be of the deformed type, ASTM A615 Grade 60 as specified on the Drawings.

- A. Epoxy-Coated Reinforcing Bars: Epoxy-coated reinforcing bars shall conform to ASTM A775/A775M. When required, damaged epoxy coating shall be repaired with patching material conforming to ASTM A775/A775M in accordance with the material manufacturer's recommendations.
- B. Zinc-coated (Galvanized Reinforcing Bars): Zinc-coated reinforcing bars shall conform to ASTM A767/A767M. When required, damaged zinc coating shall be repaired with a zinc-rich formulation conforming to ASTM A767/A767M.
- C. Welded Wire Fabric: All welded wire fabric reinforcement shall conform to ASTM A497/A497M.
- D. Identification: Bundles of reinforcing bars and wire spirals shall be tagged, with a metal tag, showing specification, grade, size, quantity, and suitable identification to permit checking, sorting, and placing. When bar marks are used to identify reinforcing bars on the Drawings, the bar mark shall be shown on the tag. Tags shall be removed prior to concrete placement.
- E. Bundles of flat sheets and rolls of welded wire fabric shall be tagged similar to reinforcing bars.

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- 2.2 TIE WIRE: 16 gauge wire ties, manufactured by American Wire Tie, Inc., or equal. When epoxy-coated reinforcing steel is shown on the Drawings, PVC coated wire ties shall be used. The minimum PVC coating shall be 0.7 mils.
- 2.3 BAR SUPPORTS: General: Bar supports and spacing shall be in accordance with the CRSI Manual of Standard Practice, Chapter 3, a maximum of four (4) feet, or as required by the Drawings.
- 2.4 FABRICATION: Fabrication tolerances for straight and bent bars shall be in accordance with the requirements of Subsection 4.3, Tolerance, of ACI 315 and the CRSI Manual of Standard Practice.

PART 3 - EXECUTION

- 3.1 GENERAL: Rust, seams, surface irregularities, or mill scale shall not be cause for rejection provided that the weight and height of deformations of a hand-wire-brushed test specimen are not less than the applicable ASTM Specification.
- 3.2 BAR LIST: Contractor shall be responsible for the accuracy of the lists and for furnishing and placing all reinforcing steel in accordance with the details shown on the Drawings.
- A. Bar lists and bending diagrams for structures, which are included on the Drawings, do not have to be furnished by Contractor. When bar lists and bending diagrams are included on the Drawings, they are intended for estimating approximate quantities. Contractor shall verify the quantity, size, and shape of the bar reinforcement against those shown on the Drawings and make any necessary corrections before ordering.
- 3.3 BENDING: All reinforcing bars shall be bent cold. Bars partially embedded in concrete shall not be field bent, except as shown on the Drawings or permitted. Bars shall not be bent or straightened in a manner that may injure the material.
- 3.4 SPIRALS: One and one-half (1-1/2) finishing bends are required at the top and bottom of the spiral. Spacers shall be provided in accordance with Chapter 5, Section 9 of the CRSI Manual of Standard Practice. Welding as an aid to fabrication and/or installation is not permitted.
- 3.5 PLACING AND FASTENING
- A. When placed in the work, the reinforcing bars shall be free from dirt, loose mill scale, paint, oil, loose rust, or other foreign substance.
- B. The placing, fastening, splicing, and supporting of reinforcing steel and wire mesh or bar mat reinforcement shall be in accordance with the Drawings and the latest edition of "CRSI Placing Reinforcing Bars." In case of discrepancy between the Drawings and the CRSI publication stated above, the Drawings shall govern. Reinforcement shall be placed within the tolerances provided in ACI 117.

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- C. Steel reinforcement shall be accurately placed in the positions shown on the Drawings and firmly held during the placing and setting of concrete by means of spacer strips, stays, metal chairs or other approved devices or supports. Precast concrete bricks or other types of bricks are not permitted for support of reinforcement in footings, slabs, or any other part of the work. Chair and bolster supports for slabs and walls shall be spaced at a maximum of four- (4-) foot centers unless otherwise shown on the Drawings. Staples used to attach bar supports to wall and roof forms shall have the staple “tails” clipped after form removal. For columns, three (3) wheels, spaced one hundred twenty degrees (120°) apart, shall be placed every four (4) feet of column height. Contractor may increase the column spiral pitch if a conflict occurs with the wheel. Pre-tied column reinforcing steel lowered into column forms shall be lowered vertically to prevent damage to the space wheels.
- D. Bars shall be securely tied at fifty percent (50%) of all intersections except where spacing is less than one (1) foot in each direction, when alternate intersections shall be tied unless otherwise called out on the Drawings or in applicable Specifications. Tying of steel by spot welding shall not be permitted unless specifically authorized by Engineer. The placing and securing of the reinforcement in any unit or section shall be accepted by Engineer before any concrete is placed in any such unit or section.
- E. Bundle bars shall be tied together at not more than six- (6-) foot centers.

3.6 SPLICING

- A. Bar steel reinforcement shall be furnished in the full lengths indicated on the Drawings. Splicing of bars, except where shown on the Drawings, shall not be permitted without the written acceptance of Engineer. Splices shall be staggered. In cases where permission is granted to splice bars, other than those shown on the Drawings, the additional material required for the lap shall be furnished by Contractor at Contractor’s own expense. The minimum distance between staggered splices for reinforcing bars shall be the length required for a lapped splice in the bar. All splices shall be full contact splices.
- B. Splices shall not be permitted at points where the section is not sufficient to provide a minimum distance of two (2) inches between the splice and the nearest adjacent bar or the surface of the concrete.
- C. Welding of reinforcement shall be done only if detailed on the Drawings or if authorized by Engineer in writing. Welding shall be done by a certified welder. The welding shall conform to AWS D1.4/D1.4M with the modifications and additions specified hereinafter. Where AWS D2.0 Specifications for Welded Highway and Railway Bridges is referenced, the reference shall be construed to be for AWS D1.1. Where the term AWS D1.1/D1.1M is used it shall mean the American Welding Society Structural Welding Code, D1.5/D1.5M as modified and amended by the AASHTO Standard Specifications for Welding of Structural Steel Highway Bridges. After completion of welding, coating damage to coated reinforcing steel bars shall be repaired.

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- D. When required or permitted, a mechanical connection may be used to splice reinforcing steel bars or as substitution for dowel bars. The mechanical connection shall be capable of developing a minimum of one hundred twenty five percent (125%) of the yield strength of the reinforcing bar in both tension and compression. All parts of mechanical connections used on coated bars, including steel splice sleeves, bolts, and nuts shall be coated with the same material used for repair of coating damage.
- 3.7 CUTTING: When coated reinforcing bars are cut in the field, the ends of the bars shall be coated with the same material used for repair of coating damage.

END OF SECTION 03 21 00

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SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

- 1.1 DESCRIPTION: This section includes materials, installation, and testing of formwork, reinforcing steel, joints, concrete, and finishing and curing for general concrete construction.
- 1.2 SUBMITTALS
- A. Submit manufacturer's catalog data and descriptive literature for form ties, spreaders, corner formers, form coatings and curing compound, bond breakers, joint sealant, backing rod, joint filler, control joints, expansion joint dowels, epoxy bonding compound, floor hardener, color additive, and rapid set cement.
 - B. Submit mill test certificates identifying chemical and physical analyses of each load of reinforcing steel delivered. If mill test reports are unavailable and the quantity of steel for a structure exceeds 5 tons, provide a laboratory test to prove conformance with the specified ASTM standard.
 - C. Submit reinforcing bending lists and placing drawings for all reinforcing. Placing drawings shall indicate all openings (mechanical, electrical, equipment, and architectural) including additional reinforcing at openings and corner bar arrangements at intersecting beams, walls, and footings indicated in the typical detail and structural drawings. Placing drawings shall be coordinated with the concrete placing schedule. Each bending list and placing drawing submitted shall be complete for each major element of a structure (grade slabs, footings, walls, deck, floor, or roof slabs) including dowels and corner bars. Furnishing such lists shall not be construed that the lists will be reviewed for accuracy. The Contractor shall be wholly and completely responsible for the accuracy of the lists and for furnishing and placing reinforcing steel in accordance with the details shown on the plans and as specified.
 - D. Submit concrete mix design at least 15 days before placing concrete. The concrete mix shall be stamped by a Professional Engineer licensed by the State of California.

PART 2 – MATERIALS

2.1 FORMWORK

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- A. Design forms according to ACI 347.
 - B. 2.1.2 Class I Forms: Use smooth-surface plywood in good condition, 3/4-inch minimum thickness.
- 2.2 BOND BREAKER: Bond breaker shall be a nonstaining type which will provide a positive bond prevention, such as Williams Tilt-Up Compound, as manufactured by Williams Distributors, Inc., Seattle, Washington; Silcoseal 77, as manufactured by SCA Construction Supply Division, Superior Concrete Accessories, Franklin Park, Illinois; or Engineer approved equal.
- 2.3 FORM RELEASE AGENT: Form release agent shall effectively prevent absorption of moisture and prevent bond with the concrete. Agent shall be nonstaining and nontoxic after 30 days.
- 2.4 REINFORCING STEEL
- A. Reinforcement shall conform to ASTM A 615, Grade 60.
 - B. Fabricate reinforcing in accordance with the current edition of the Manual of Standard Practice, published by the Concrete Reinforcing Steel Institute. Bend reinforcing steel cold.
 - C. Deliver reinforcing steel to the site bundled and tagged with identifying tags.
- 2.4 WELDED WIRE FABRIC: Welded wire fabric shall conform to ASTM A 185.
- 2.5 TIE WIRE: Tie wire shall be 16 gauge minimum, black, soft annealed.
- 2.6 BAR SUPPORTS: Bar supports in beams and slabs exposed to view after form stripping shall be galvanized and plastic coated. Use concrete supports for reinforcing in concrete placed on grade.
- 2.7 BAR COUPLERS: Reinforcing steel bar splicing couplers shall only be used when approved in writing by the Engineer. Couplers shall be a mechanical type as manufactured by Dayton Barsplice Inc. or Engineer approved equal. Use couplers which do not reduce tensile or ultimate strength of bars.
- 2.8 JOINT SEALANT: Joint sealant shall be a multipart, gray, nonstaining, nonsagging, polyurethane sealant, which cures at ambient temperature to a firm, flexible, resilient, tear-resistant rubber. Sealant shall be RC 270 of Products Research and Chemical Corporation, Mameco International Vulkem 227, Multi-Chem MC287, or Owner approved equal.

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<i>TECHNICAL REQUIREMENTS</i>	
<i>Consistency</i>	<i>Gun grade</i>
<i>Tack free time</i>	<i>24 hours at 75°F and 50% R.H.</i>
<i>Pot life</i>	<i>1 to 3 hours</i>
<i>Hardness</i>	<i>35 Shore A, ±5</i>
<i>Elongation</i>	<i>700%</i>
<i>Tensile strength, ASTM D 412</i>	<i>300 psi</i>
<i>Peel strength on concrete</i>	<i>No loss of bond after 24 hours at 150% elongation</i>
<i>Temperature service range</i>	<i>-40°F to +175°F</i>
<i>Immersion in water</i>	<i>Continuous</i>

- 2.9 **BACKING ROD FOR EXPANSION JOINTS:** Backing rod shall be an extruded closed-cell polyethylene foam rod, such as Minicel backer rod, manufactured by Industrial Systems Department, Plastic Products Group of Hercules, Inc., Middletown, Delaware; Ethafoam SB, as manufactured by Dow Chemical Company, Midland, Michigan; or Owner approved equal. The rod shall be 1/4-inch larger in diameter than the joint width. Where possible, provide full length sections for the joint; minimize splices. Apply backup rod and bond breaker tape in expansion joints.
- 2.10 **BOND BREAKER TAPE:** Bond breaker tape shall be an adhesive-backed glazed butyl or polyethylene tape which will adhere to the premolded joint material or concrete surface. The tape shall be the same width as the joint. The tape shall be compatible with the sealant.
- 2.11 **PREFORMED CONTROL JOINT:** Preformed control joint shall be a one-piece, flexible, PVC joint former, such as Kold-Seal Zip-Per Strip KSF-150-50-50, manufactured by Vinylex Corp., Knoxville, Tennessee, or a one-piece steel strip with preformed groove, such as Keyed Kold Retained Kap, manufactured by Burke Concrete Accessories, Inc., San Mateo, California, or Owner approved equal. Provide the preformed control joint material in full length unspliced pieces.
- 2.12 **PREFORMED JOINT FILLER:** Joint filler shall be preformed, nonextruded type constructed of closed-cell neoprene conforming to ASTM D 1752, Type I, as manufactured by W. R. Grace Company of Cambridge, Massachusetts; W. R. Meadows, Inc., Elgin, Illinois; or Owner approved equal.
- 2.13 **STEEL EXPANSION JOINT DOWELS:**

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- A. Steel expansion joint dowels shall conform to one of the following:
 - B. Epoxy coated steel bar dowels with a 12-mil coating thickness. Steel bar dowels shall conform to ASTM A 36 or ASTM 615, plain rounds, Grade 40. Epoxy coating shall be in conformance with ASTM A 775; or
 - C. Stainless steel bar dowels conforming to ASTM A 276, Type 302.
 - D. Exposed portion of expansion joint dowels shall be thoroughly greased prior to casting of adjoining wall or slab.
- 2.14 CEMENT: Cement shall conform to ASTM C 150, Type II/V, with maximum tricalcium aluminate not to exceed 8%. The maximum percent alkalis shall not exceed 0.6%.
- 2.15 RAPID SET CEMENT: Rapid set cement is a unique dry blend of hydraulic cement and other ingredients that provide fast sets and high strengths within an hour. Cement shall be free of calcium chloride. Use 400 pounds of rapid set cement per cubic yard of mix and combine with the sand and aggregate as specified for Class A concrete. Rapid set cement shall be as manufactured by CTS Cement Manufacturing Company or Owner approved equal. Deliver the rapid set cement, sand, and aggregate to the job site in a dry and uncombined condition. Use a mobile mixer truck to combine the components with water at the point of use.
- 2.16 AGGREGATES: Aggregates shall comply with ASTM C 33 and shall contain less than 1% asbestos by weight or volume and be free from any substances that will react with the cement alkalis.
- 2.17 COLOR ADDITIVE FOR EXTERIOR ELECTRICAL DUCT ENCASEMENT: For exterior electrical duct concrete encasements, use a color additive for identification purposes: brick red "Colorfull," as manufactured by Owl Manufacturing Company, Arcadia, California; coral red "Chromix C-22," as manufactured by L. M. Scofield Company, Los Angeles, California; or Owner approved equal. Add the color additive while the concrete is being mixed using the quantity per cubic yard of concrete recommended by the manufacturer for the class of concrete indicated.
- 2.18 CONCRETE ADMIXTURES
- A. Concrete admixtures shall be specified within the submitted mix design and shall not be used without approval by the Engineer.
 - B. Do not use any admixture that contains chlorides or other corrosive elements in any concrete.
- 2.19 GROUT

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- A. Grout shall be non-shrink cementitious grout with a 28-day compressive strength of 5,000 psi by Five Star, or Engineer approved equal.
- B. Dry pack in accordance with manufacturer's installation literature is acceptable where specified on the project drawings or where approved by the Engineer.

2.20 MORTAR

- A. Mortar or grout placed on horizontal construction joints shall be a mixture of cement, sand, and water in the same proportions used in the concrete but with coarse aggregate omitted.
- B. Mortar used for repair of concrete shall be made of the same materials as used for concrete, except that the coarse aggregate shall be omitted and the mortar shall consist of not more than one part cement to two and one-half parts sand by damp loose volume. The quantity of mixing water shall be no more than necessary for handling and placing.

2.21 BONDING COMPOUND: Epoxy bonding compound shall be Concreative 1001 LPL, Adhesive Engineering Company, San Carlos, California; Sikadur Hi-Mod (Sikastix 370), Sika Chemical Corporation, Lyndhurst, New Jersey; Epoxitile 2391 by W. R. Grace and Company; Euco Epoxy 463 by Euclid Chemical Company; or Owner approved equal.

- A. Nonepoxy bonding compound shall be Weldcrete by Larsen Products Corp., Link by Sta- Dry Manufacturing Corp., Euco Weld by Euclid Chemical Co., or Owner approved equal. The compound shall be rewettable for up to two weeks.

2.22 CONCRETE MIX DESIGN

- A. Conform to ASTM C 94, except as modified by these Standard Specifications.
- B. Maximum water-cement ratio = 0.45 by weight.
- C. 28-day compressive strength = 2,500psi.
- D. Measure slump in accordance with ASTM C 143. Slump shall be between 4" and 6" max.
- E. Aggregate size shall be 1-1/2 inches maximum
- F. Mix design for pumped concrete shall produce a plastic and workable mix. The percentage of sand in the mix shall be based on the void content of the coarse aggregate.

2.23 CONCRETE TESTS: The Owner will require the Contractor to test for concrete quality as described below.

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- A. Frequency of Sampling: Cast four concrete test cylinders from each 50 cubic yards, or fraction thereof, of each class of concrete placed in any one day. Sampling and curing of cylinders shall conform to ASTM C 31.
- B. Strength Testing: Test cylinders in accordance with ASTM C 39. Test one cylinder at 7 days for information; test two cylinders at 28 days for acceptance; and hold one cylinder for verification. Strength acceptance will be based on the average of the strengths of the two cylinders tested at 28 days. If one cylinder of a 28-day test manifests evidence of improper sampling, molding, or testing, other than low strength, discard it and use the fourth cylinder for the test result.
- C. Determine concrete slump by ASTM C 143 with each strength test sampling and as required to establish consistency.
- D. Determine air content of the concrete using ASTM C 231 to verify the percentage of air in the concrete immediately prior to depositing in forms.
- E. The average value of concrete strength tests shall be equal to or greater than the specified 28-day strength. No test shall be less than 90% of the specified 28-day strength.
- F. If the 28-day strength tests fail to meet the specified minimum compressive strength, the concrete will be assumed to be defective and one set of three cores from each area may be taken as selected by the Owner's Representative and in accordance with ASTM C 42. If the average compressive strength of the set of three concrete cores fails to equal 90% of the specified minimum compressive strength or if any single core is less than 75% of the minimum compressive strength, the concrete will be considered defective. The Owner may require additional coring, nondestructive load testing, or repair of defective concrete. Costs of coring, testing of cores, load testing, and required repairing pertaining thereto shall be paid by the Contractor at no extra cost to the Owner.

2.24 CURING COMPOUND

- A. Curing compound shall conform to ASTM C 309.
- B. Curing compound shall be compatible with required finishes and coatings and shall meet the State of California Clean Air Quality Standards which limit the quantity of volatile organic compounds to 250 grams per liter.

2.25 MATS, PAPER, AND SHEETING FOR CURING

- A. Burlap mats shall conform to AASHTO Specification M182.
- B. Sisal-kraft paper and polyethylene sheets shall conform to ASTM C 171.

PART 3 – EXECUTION

3.1 FORM TOLERANCES

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- A. Failure of the forms to produce the specified concrete surface and surface tolerance shall be grounds for rejection of the concrete work. Rejected work shall be repaired or replaced at no additional cost to the Owner.
- B. The following table indicates tolerances or allowable variations from dimensions or positions of structural concrete work:

	<u>Maximum Tolerance</u>
<i>Sleeves and inserts</i>	+1/4"-1/4"
<i>Projected ends of anchors</i>	+1/4"-0.0"
<i>Anchor bolt setting</i>	+1/4"-1/4"
<i>Finished concrete, all locations</i>	+1/4"-1/4" in 10 feet Max ±1" in total length

- C. The planes or axes from which the above tolerances are to be measured shall be as follows:
 - D. Sleeves and inserts: Centerline of sleeve or insert.
 - E. Projected ends of anchors: Plane perpendicular to the end of the anchor as located on the Drawings.
 - F. Anchor bolt setting: Centerline of anchor bolt.
 - G. Finish concrete: The concrete surface as located on the Drawings.
 - H. Where equipment is to be installed, comply with manufacturer's tolerances if more restrictive than above.

3.2 FORM SURFACE PREPARATION

- A. Clean form surfaces to be in contact with concrete of foreign material prior to installation.
- B. Coat form surfaces in contact with concrete with a release agent prior to form installation.

3.3 FORM REUSE: Reuse only forms which provide a uniform surface texture on exposed concrete surfaces. Apply light sanding or other surface treatment between uses for uniform texture. Plug unused tie rod holes with corks, shave flush, and sand the concrete surface side. Do not patch forms other than filling tie rod holes, except in the case of Class II forms. Do not use metal patching discs on Class I forms.

3.4 REMOVAL OF FORMS

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- A. Forms and shoring for elevated structural slabs or beams shall remain in place until the concrete has reached a compressive strength equal to the specified 28-day compressive strength as determined by test cylinders. Do not remove supports and reshore. The following table indicates the minimum allowable time after the last cast concrete is placed before forms, shoring, or wall bracing may be removed:

<i>Sides of footings and encasements:</i>	<i>24 hours</i>
<i>Walls, vertical sides of beams, girders, columns, and similar members not supporting loads:</i>	<i>48 hours</i>
<i>Slabs, beams, and girders:</i>	<i>10 days (forms only)</i>
<i>Shoring for slabs, beams, and girders:</i>	<i>Until concrete strength reaches specified 28-day strength</i>
<i>Wall bracing:</i>	<i>Until top of roof slab concrete reaches specified 28-day strength</i>

- B. Do not remove forms from concrete which has been placed with outside air temperature below 50F without first determining if the concrete has properly set without regard for time. Do not apply heavy loading on green concrete. Immediately after forms are removed, the surface of the concrete shall be carefully examined and any irregularities in the surface shall be repaired and finished as specified.
- 3.5 **FORMED OPENINGS:** Openings shall be of sufficient size to permit final alignment of pipes or other items without deflection or offsets of any kind. Allow space for packing where items pass through the wall to ensure watertightness. Provide openings with continuous keyways and waterstops. Provide a slight flare to facilitate grouting and the escape of entrained air during grouting. Provide formed openings with reinforcement as indicated in the typical structural details. Reinforcing shall be at least 2 inches clear from the opening surfaces and encased items.
- 3.6 **EMBEDDED ITEMS:** Set anchor bolts and other embedded items accurately and hold securely in position until the concrete is placed and set. Check all special castings, channels, or other metal parts that are to be embedded in the concrete prior to and again after concreting. Check all nailing blocks, plugs, and strips necessary for the attachment of trim, finish, and similar work prior to concreting.
- 3.7 **PIPES AND WALL SPOOLS CAST IN CONCRETE**

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- A. Install pipes, wall spools, and wall anchors before placing concrete. Do not weld, tie or otherwise connect the pipes, spools or anchors to the reinforcing steel.
 - B. Support pipe and fabricated fittings, to be encased in concrete, on concrete piers or pedestals.
- 3.8 **EVELED EDGES (CHAMFER):** Form 3/4-inch beveled edges on exposed concrete edges and corners, beam soffit corners, and where indicated on the Drawings. Reentrant corners in concrete members shall not have fillets, unless otherwise shown in the Drawings. The top edges of slabs, walkways, beams, and walls may be beveled with an edging trowel in lieu of using chamfer strips.
- 3.9 **CONSTRUCTION JOINTS:**
- A. Layout of construction joints shall be as shown in the Drawings and according to the following guidelines:
 - 1. Provide horizontal construction joints at top of foundation members and slabs-on-grade and at the soffit of supported slabs and beams.
 - 2. Space the construction joints at a maximum horizontal distance of 25 feet and a maximum vertical distance of 16 feet.
 - 3. Space the corner vertical construction joints between 4 and 8 feet from the corner of walls or wall intersections.
 - 4. Space horizontal construction joints at least 8 inches below bottom of slabs.

For slabs-on-grade that are not subject to hydraulic loading, use formed construction joints. Maximum size of pour shall be 30 feet each way for slabs with wire mesh reinforcement and 75 feet each way for slabs with bar reinforcement. Allow 24 hours between pours of adjacent slabs. Provide joints as specified or shown. Set continuous expansion joint strips between slabs and abutting vertical surfaces as indicated in the Drawings.

- B. Place expansion joint fillers every 30 feet in straight runs of walks, at right-angle turns, and wherever concrete walks butt into vertical surfaces.
- C. For control joints of nonstructural slabs, provide partial depth plastic strips set flush with finished surface or 1/8-inch-wide joints cut with a diamond saw. Use control joints one-quarter to one-third the depth of the slab unless otherwise indicated.
- D. Construction joints shall be keyed, unless otherwise detailed. Form keyways by beveled strips or boards placed at right angles to the direction of shear. Except where otherwise shown on the Drawings or specified, keyways shall be at least 1-1/2 inches in depth over at least 25% of the area of the section.
- E. When it is necessary to make a joint because of an emergency, furnish and place reinforcing dowels across the joint. Embed dowels 48 bar diameters each side of the joint. Size and number of dowels shall match reinforcing in

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- the member. Furnishing and placing such reinforcing steel shall be at the Contractor's expense.
- F. After the pour has been completed to the construction joint and the concrete has hardened, thoroughly clean the entire surface of the joint of surface laitance, loose or defective concrete, and foreign material, and expose clean aggregate by sandblasting the surface of construction joints before placing the new concrete. Cover horizontal construction joints with mortar. Spread uniformly and work thoroughly into all irregularities of the surface. The water-cement ratio of the mortar in place shall not exceed that of the concrete to be placed, and the consistency of the mortar shall be suitable for placing and working.
- G. In case of emergency, place additional construction joints. (An interval of 45 minutes constitutes cause for an emergency construction joint.)
- 3.10 EXPANSION JOINTS: Provide expansion joints with continuous edge reservoirs, which shall be filled with a joint sealant. Leave the material used for forming the reservoirs in place until immediately before the grooves are cleaned and filled with joint sealant. After removing edge forms from the reservoir, remove grout, loose concrete, and fins; then sandblast the slots. Allow the reservoirs to become thoroughly dry; then blow out the reservoirs and immediately prime and fill with the expansion joint sealant and backup materials. The primer used shall be supplied by the same manufacturer supplying the joint sealant.
- 3.11 INSTALLATION OF PREMOLDED JOINT FILLER: Install in joint accurately as shown. Attach to concrete with a bonding agent recommended by the joint sealant and joint filler manufacturer for compatibility.
- 3.12 INSTALLATION OF JOINT SEALANTS
- A. Immediately before installing the joint sealant, clean the joint cavity by sandblasting or power wire brushing. Install bond breaker tape per manufacturer's instructions.
- B. After the joints have been prepared as described above, apply the joint sealant. Apply the primer, if required, and joint sealant only with the equipment and methods recommended by the joint sealant manufacturer. Application criteria for the sealant materials, such as temperature and moisture requirements and primer cure time, shall be in accordance with the recommendations of the sealant manufacturer.
- C. Apply masking tape along the edges of the exposed surface of the exposed joints. Trowel the joints smooth with a tuck pointing tool wiped with a solvent recommended by the sealant manufacturer.
- D. After the sealant has been applied, remove the masking tape and any sealant spillage.
- 3.13 INSTALLATION OF STEEL EXPANSION JOINT DOWELS: Install parallel to wall or slab face, perpendicular to the joint face, and in true horizontal position. Secure tightly in forms with rigid ties. Orient dowels to permit joint movement.

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- A. **PLACING REINFORCING:**Place reinforcing steel in accordance with the current edition of Recommended Practice for Placing Reinforcing Bars, published by the Concrete Reinforcing Steel Institute.
 - B. Place reinforcing in accordance with the following, unless otherwise indicated.Reinforcement indicated on the drawings is continuous through the structure to the farthest extent possible. Terminate bars 2 inches clear from faces of concrete.
 - C. Splices may be used to provide continuity due to bar length limitations. Minimum length of bars spliced for this reason is 40 feet. Splicing of reinforcement which is detailed to be continuous on the Drawings is not permitted.
 - D. Reinforcing steel, before being positioned and just prior to placing concrete, shall be free from loose mill and rust scale and from any coatings that may destroy or reduce the bond. Clean reinforcing steel by sandblasting or wire brushing and remove mortar, oil, or dirt to remove materials that may reduce the bond.
 - E. Do not straighten or rebend reinforcing steel in the field. Do not use reinforcing with bends not shown in the Drawings.
 - F. Position reinforcing steel in accordance with the Drawings and secure by using annealed wire ties or clips at intersections and support by concrete or metal supports, spacers, or metal hangers. Do not place metal clips or supports in contact with the forms. Bend tie wires away from the forms to provide the specified concrete coverage. Bars additional to those shown on the Drawings, which may be found necessary or desirable by the Contractor for the purpose of securing reinforcement in position, shall be provided by the Contractor at his own expense.
 - G. Place reinforcement a minimum of 2 inches clear of any metal pipe or fittings.
 - H. Secure reinforcing dowels in place prior to placing concrete. Do not press dowels into the concrete after the concrete has been placed.
 - I. Roll welded wire fabric used for reinforcement flat before placing concrete. Extend fabric to within two inches of the slab edges and lap splices at least 1-1/2 courses of the fabric and a minimum of 6 inches. Tie laps and splices at ends and at 24 inches on center. Pull the fabric into position as the concrete is placed by means of hooks, and work concrete under the fabric to ensure that it is placed at the proper distance above the bottom of the slab.
 - J. Position dowels for masonry walls to occur at reinforced block cells.
- 3.14 **SITE MIXED CONCRETE:** Conform to ACI 304.
- 3.15 **READY MIXED CONCRETE:** Conform to ASTM C 94.
- 3.16 **PLACING CONCRETE**

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- A. Conform to ACI 304.
- B. Place ready-mixed concrete within the specified delivery time after initial batching based on the outside temperature. Ready-mixed concrete exceeding the delivery time will be rejected by the Owner's Representative.

<u>Outside Temperature</u>	<u>Delivery Time</u>
<i>Below 40°F (4°C)</i>	<i>See Cold Weather Placing</i>
<i>40 to 85°F (4 to 29°C)</i>	<i>90 minutes</i>
<i>86 to 90°F (30° to 32°C)</i>	<i>75 minutes</i>
<i>Above 90°F (32°C)</i>	<i>60 inutes</i>

- 3.17 PUMPING CONCRETE: Conform to ACI 304.2R-71.
- 3.18 WEATHER REQUIREMENTS: Conform to ACI 305 for placing during hot weather.
- 3.19 CONFORM TO ACI 306 FOR PLACING DURING COLD WEATHER: Do not place ready-mixed concrete in the rain or at times when rain is expected or forecasted. The Owner's Representative in his sole judgement may reject any concrete work that is affected by rain.
- 3.20 BONDING TO OLD CONCRETE: Coat the contact surfaces with epoxy bonding compound. The method of preparation and application of the bonding compound shall conform to the manufacturer's printed instructions and recommendations for specific application for this project.
- 3.21 BACKFILL AGAINST WALLS:
 - A. Do not place backfill against walls until the concrete has obtained a compressive strength equal to the specified 28-day compressive strength. Where backfill is to be placed on both sides of the wall, place the backfill uniformly on both sides.
 - B. Do not backfill the walls of structures that are laterally restrained or supported by suspended slabs or slabs on grade until the slab is poured and the concrete has reached the specified compressive strength.
- 3.22 CONCRETE FINISHES: Complete concrete surfaces in accordance with the following schedule:

<u>Finish Designation</u>	<u>Area Applied</u>
4-1	Beams, columns, and exterior walls not exposed to view.
F-3	Beams, columns, and walls of structures or buildings exposed to view. Underside of formed floors or slabs.
F-4	Exterior and interior surfaces to be coated.
S-1	Slabs and floors to be covered with concrete grout.

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- S-4 Slabs and floors of structures or buildings exposed to view.
- S-5 Slabs and floors at slopes greater than 10% and stairs.
- E-1 Exposed edges. EXCEPTION: edges normally covered with earth.
- E-2 Top of walls, beams, and similar unformed surfaces.

3.23 CONCRETE CURING

- A. Conform to ACI 308.
- B. Water cure with burlap mats unless optional curing methods are permitted.
- C. Do not use curing compound on surfaces which are to be coated with clear floor hardener.
- D. It is the responsibility of the Contractor to select the appropriate curing method in response to climatical and/or site conditions occurring at the time of concrete placement. Take appropriate measures as described in ACI 305 and 306 for protecting and curing concrete during hot and cold weather.

3.24 REPAIR OF DEFECTS

- A. Do not repair defects until concrete has been reviewed by the Owner's Representative.
- B. Surface Defects: Repair surface defects that are smaller than 1-foot across in any direction and are less than 1/2-inch in depth.
- C. Repair by removing the honeycombed and other defective concrete down to sound concrete, make the edges perpendicular to the surface and at least 3/8-inch deep, thoroughly dampen the surface, work into the surface a bonding grout (one part cement to one-part fine sand), fill the hole with mortar, match the finish on the adjacent concrete, and cure as specified.
- D. severe Defects: Repair severe defects that are larger than surface defects but do not appear to affect the structural integrity of the structure.
- E. Repair by removing the honeycombed and other defective concrete down to sound concrete, make the edges of the hole perpendicular to the surface, sandblast the surface, coat the sandblasted surface with epoxy bonding compound, place nonshrink grout, match the finish on the adjacent concrete, and cure as specified.
- F. Major Defects: If the defects are serious or affect the structural integrity of the structure or if patching does not satisfactorily restore the quality and appearance to the surface, the Owner may require the concrete to be removed and replaced, complete, in accordance with the provisions of this section.

3.25 REPAIR OF CRACKS

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- A. Repair cracks in concrete structures that are wider than 1/10-inch in width by cutting out a square edged and uniformly aligned joint 3/8-inch wide by 3/4-inch deep, preparing exposed surfaces of the joint, priming the joint, and applying polyurethane joint sealant.
- B. If the cracks are serious or affect the structural integrity or function of the element, the Owner's Representative may require the concrete to be removed and replaced, complete, in accordance with the provisions of this section.

3.26 CLEAR HARDENER APPLICATION (SURFACE APPLIED)

- A. Cure, clean, and keep floors dry to receive hardener. Complete work immediately above floors prior to applying hardener. Apply hardener evenly, using three coats, allowing 24 hours between coats. The first coat shall be one-third strength, second coat one-half strength, and third coat two-thirds strength. Apply each coat so as to remain wet on the concrete surface for 15 minutes. Apply proprietary hardeners in conformance with the manufacturer's instructions. After the final coat is completed and dry, remove surplus hardener from the surface by scrubbing and mopping with water.
- B. Apply hardener to the surfaces designated in the Drawings.
- C. Apply hardener to risers and treads of concrete stairs as described above.

3.27 ALUMINUM SURFACES IN CONTACT WITH CONCRETE: Coat aluminum surfaces shall be placed in contact with concrete.

END OF SECTION 03 30 00

SECTION 03 30 53

LIGHT POLE CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included: Concrete foundations for new site lighting.
- B. Related Work: Section 26 51 00 – Site Lighting

1.2 REFERENCES

- A. ACI 301 - "Specifications for structural concrete for buildings"
- B. ACI 304 - "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete"
- C. ASTM C33 - "Specification for concrete aggregates"
- D. ASTM C94 - "Specification for ready mixed concrete"
- E. ASTM C143 - "Test method for slump of Portland Cement concrete"
- F. ASTM C150 - "Specification for Portland Cement"
- G. CBC, 2016 edition

1.3 QUALITY ASSURANCE: Perform all work in accordance with ACI 301.

1.4 COORDINATION

- A. Ensure embedded items are in-place ready for concrete placement.
- B. Cutting and patching necessary to embed items preparatory to concrete placement shall be at no additional cost to the City.
- C. Coordinate resurfacing repairs for tennis courts in conjunction with concrete and electrical work.

1.5 SAFETY MEASURES: Contractor shall always be solely and completely responsible for temporary shoring, additional reinforcing, bracing, formwork, and related conditions of job site including safety of person's and property, and for all necessary independent engineering reviews of these conditions.

PART 2 - PRODUCTS

2.1 CONCRETE MATERIALS

- A. Portland Cement: Type II conforming to ASTM C150
- B. Aggregate type: ASTM C33 C.

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1. Coarse: Cleanness value not less than 75 when tested in accordance with California Test 227.
 2. Fine: Sand equivalent not less than 75 when tested in accordance with California Test 217.
- C. Water: Clean, free from oil, acids, alkalis, salts or other deleterious matter.
- D. Admixtures: Use no admixtures unless approved in writing by District; no calcium chloride permitted.
- 2.2 MIXES
- A. Strength: Minimum 3,000 PSI after 28 days, tested in accordance with ASTM C39.
 - B. Slump: 5" maximum when tested in accordance with ASTM C143.
 - C. Maximum water/cement ratio shall not exceed 0.5 unless approved by City.

PART 3 - EXECUTION

3.1 GROUNDWATER

- A. Groundwater shall be anticipated during construction at San Pablo Park. Due to presence of layers of sandy material and possible groundwater within anticipated pole depths, raveling or caving shall be expected which shall require temporary casing during construction.
- B. Work required for casing and dewatering, shall be provided, at no additional cost, by the Contractor.

3.2 POLE EXCAVATIONS

- A. City's representative shall observe all excavations prior to placement of concrete so that if soil conditions differ from those anticipated, appropriate recommendations can be made.
- B. Pole excavations may be allowed to stand open overnight with cover plates. Foundations shall be poured as soon as possible after inspection. Appropriate measures shall be taken to pump out any water that may flow into excavations. Use tremie tube for placing concrete in foundations. Hole bottoms shall be properly cleaned of debris.

3.3 PREPARATION

- A. Protect finished court surfaces, walkways and grass, adjacent to concrete-receiving places.
- B. Place protective plywood sheets and underlayment material to prevent damage to court surfaces.
- C. Clean transporting and handling equipment at frequent intervals and flush thoroughly with water before each day's run. Do not discharge the wash water into concrete form.

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- D. Vibrate concrete to full depth of excavations.
 - E. Notify the City at least 48 hours before placing concrete.
- 3.4 CONCRETE MIXING
- A. Ready-mixed concrete shall be mixed for a period of not less than ten minutes and at least three minutes of the mixing period shall be immediately prior to discharging of the job.
 - B. Introduction of additional water after initial mixing will not be permitted.
- 3.5 CONVEYING AND PLACING
- A. Place concrete in accordance with ACI 301. Contractor shall keep a record on the site of the time and the date of placing concrete in each excavation; this record shall be open to the inspection of the City.
 - B. Concrete Placement: Once started, shall it be carried on as a continuous operation until the section of approved sized and shape is completed.
 - C. Concrete shall be handled as rapidly as practicable from the mixer to the place of final deposit by methods that prevent the separation or loss of ingredients.
 - D. Concrete that has partially hardened shall not be deposited in the work.
- 3.6 FINISHING: Concrete shall be struck off and leveled, do not work the concrete further until ready to float. Begin floating when the water sheen disappears and/or when the mix stiffens sufficiently to permit the proper operation of hand or power driven floating. Float surface finish of the concrete.
- 3.7 PROTECTION AND CURING
- A. Concrete shall be protected from injurious action of the elements and defacement of any nature during construction operations.
 - B. Place plywood collars or factory-made tubes around holes to prevent falling dirt from filling hole. Strip collars or tubes after curing period.
 - C. All forms shall be kept sufficiently wet to prevent drying out of the concrete.
- 3.8 CLEANING: Clean exposed portions of concrete bases, concrete surfaces, and grass soiled stained by the leakage or spatter of concrete.

END OF SECTION 03 30 53

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SECTION 03 35 00

CONCRETE FINISHING

PART 1 – GENERAL

- 1.1 SECTION INCLUDES: Contractor shall supply all labor, tools, equipment, and materials to finish properly placed concrete for structures.
- 1.2 RELATED SECTIONS: The following is a list of SPECIFICATIONS which may be related to this section:
 - A. Section 03100, Forms and Accessories.
 - B. Section 03210, Reinforcing Steel.
 - C. Section 03360, Cast-in-Place Concrete.
- 1.3 REFERENCES: The following is a list of standards which may be referenced in this section:
 - A. American Concrete Institute (ACI):
 - B. 116, Cement and Concrete Terminology.
 - C. 121, Quality Assurance Systems for Concrete Construction.
 - D. SP-15, ACI 301 Field Reference Manual.
 - E. 309, Identification and Control of Consolidation-Related Surface Defects in Formed Concrete.
 - F. 311, Guide for Inspection of Concrete.
 - G. ASTM International (ASTM):
 - H. C33, Standard Specification for Concrete Aggregates.
 - I. C150, Standard Specification for Portland Cement.
 - J. U.S. Department of Interior—Bureau of Reclamation (USBR):
 - K. M-47, Standard Specifications for Repair of Concrete.
- 1.4 SUBMITTALS: Provide product data on the following:
 - A. Grout.
 - B. Bonding agent.
 - C. Method of repairing defects, unless otherwise called out herein.
- 1.5 DELIVERY, STORAGE, AND HANDLING: Deliver the materials to the Project site in the manufacturer's containers with all labels intact and legible at the time of use. Materials shall be stored in a secure, indoor, dry area. Maintain grouts and aggregates in a dry condition during delivery, storage, and handling.

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PART 2 – PRODUCTS

2.1 MATERIALS

- A. Premixed Pre-Packaged Grout: Non-Shrink Grout by Five Star, or Engineer approved equal.
- B. Epoxy Bonding Agent:
 - 1. Master Builders; Concreive Liquid (LPL).
 - 2. Master Builders; Concreive Standard Liquid.
- C. Cement: ASTM C150, Type II/V.
- D. Aggregate: ASTM C33, one hundred percent (100%) passing the No. 30 mesh sieve.
- E. Bond Coat Mortar: Mortar used to bond patching mortar shall be made of the same materials and of approximately the same proportions as used for the concrete, except that the coarse aggregate shall be omitted and the mortar shall consist of one (1) part cement to not more than one (1) part sand by damp loose volume.
- F. Patching Mortar: Patching mixture shall be made of the same materials and of approximately the same proportions as used for the concrete, except that the coarse aggregate shall be omitted and the mortar shall consist of one (1) part cement to not more than two and one-half (2-1/2) parts sand by damp loose volume. White Portland cement shall be substituted for a part of the gray Portland cement on exposed concrete in order to produce a color matching the color of the surrounding concrete, as determined by a trial patch. The quantity of mixing water shall be no more than necessary for handling and placing. The patching mortar shall be mixed in advance and allowed to stand with frequent manipulation with a trowel, without addition of water, until it has reached the stiffest consistency that shall permit placing.
- G. Water: Only clean potable water shall be used. A calibrated measuring device is required for measuring the proper amount of water to be added to pre-packaged grouts and mortars.

PART 3 – EXECUTION

3.1 PREPARATION

- A. The means and methods of repair of improperly placed or finished concrete shall be reviewed by Engineer prior to performing the work. Regardless of prior approval of the means and methods of concrete finish repair, no concrete finish shall be repaired until Engineer has reviewed the existing finish. This includes defects caused by ineffective and improper vibration such as honeycomb, excessive air voids on formed surfaces, placement “pour”

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- lines (cold joints), and sand streaking. It also includes defects caused by excessive form deflections, form damage, or form failure.
- B. Repair of Surface Defects:
 - C. Surface defects, unless otherwise specified by the Contract Documents, shall be repaired immediately after form removal, but not before review by Engineer. The surface temperature of the concrete shall be fifty degrees Fahrenheit (50F) and rising. Contractor shall measure surface temperatures when requested by Engineer. If necessary, Contractor shall enclose and heat the area to be repaired to bring the surface temperature of the concrete and air temperature to acceptable levels, and to permit proper curing.
 - D. All honeycombed and other defective concrete shall be removed down to sound concrete. If chipping is necessary, the edges shall be perpendicular to the surface or slightly undercut. Feathered edges shall not be permitted. The area to be patched and an area at least six (6) inches wide surrounding it shall be dampened to prevent absorption of water from the patching mortar. A bonding grout shall be prepared, mixed to the consistency of thick cream, and after surface water has evaporated from the area to be patched, well brushed into the surface.
 - E. When the bond coat begins to lose the water sheen, the premixed patching mortar shall be applied. The mortar shall be thoroughly consolidated into place and struck off so as to leave the patch slightly higher than the surrounding surface. To permit initial shrinkage, it shall be left undisturbed for at least one hour before being finally finished. The patched area shall be kept damp for seven (7) days. Metal tools shall not be used in finishing a patch in a formed wall that shall be exposed.
 - F. Alternative Surface Defect Repairs:
 - G. Certain types of defects may require the use proprietary compounds for adhesion or as patching ingredients. Engineer shall review these defects and request means and methods for these repairs from Contractor.
 - H. In lieu of, or in addition to, the foregoing patching procedures using bond coat and patching mortars, epoxy bonding agents and premixed pre-packaged grouts may be used for repair of defective areas. Such compounds shall be used in accordance with the manufacturer's written recommendations and directions. Engineer shall review and provide written acceptance of these procedures.

3.2 APPLICATION

- A. Tie Holes: Unless otherwise called out in the Drawings tie holes shall be finished as specified herein.
- B. Water Retaining Structures and Below grade Vaults with Breakback Cone Ties: Fill tie holes solid with grout.

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- C. Other Structures: After being cleaned and thoroughly dampened, fill tie holes solid with grout.
- D. Finishing of Formed Surfaces: Finishes shall be performed as called out on the Drawings and in referenced Specifications.
- E. Smooth Form Finish: The form facing material shall produce a smooth, hard, uniform texture on the concrete. The arrangement of the facing material shall be orderly and symmetrical, with the number of seams kept to the practical minimum. Surface textures that result from forms with raised grain, torn surfaces, worn edges, patches, dents, or other defects shall be ground smooth or otherwise repaired.
- F. Air Voids on Formed Surfaces: Air voids on formed surfaces deeper than one-quarter ($\frac{1}{4}$) inch shall be filled with patching mortar. The total void area is one percent (1%) of the surface area, or thirty-six hundredths (0.36) square inches.
- G. Tie Holes: Tie holes shall be filled with grout.
- H. Form Fins: Chip or rub off form fins exceeding one-sixteenth ($\frac{1}{16}$) inch in height.
- I. Rock Pockets: Poorly consolidated concrete shall be removed to sound concrete and the defect repaired. Engineer shall outline the area to be repaired.
- J. As-Cast Finish: For as-cast concrete finish form materials shall produced a sound surface.
- K. Air Voids: Fill air voids deeper than one-quarter ($\frac{1}{4}$) inch and larger than one-half ($\frac{1}{2}$) square inch. The total area of acceptable air voids is seventy-two hundredths (0.72) square inch in a six-inch (6") by six-inch (6") square.
- L. Tie Holes: Tie holes shall be filled with grout.
- M. Form Fins: Chip or rub off form fins exceeding one-eighth ($\frac{1}{8}$) inch in height.
- N. Rubbed Finish: Immediately after removing the forms, form ties shall be broken back a minimum of three-quarters ($\frac{3}{4}$) inch from the surface, honeycomb, voids, and other surface defects grouted. The surfaces shall then be thoroughly dampened and rubbed with a No. 16 carborundum stone or equal abrasive to create a uniform surface paste. The rubbing shall be continued to remove all form marks and surface irregularities producing a smooth, dense surface. After setting, the surface shall then be rubbed with a No. 30 carborundum stone until the surface is smooth in texture and uniform in color. Unless otherwise shown in the Drawings only exposed surfaces shall have a rubbed finish.
- O. Grout Finish: Prepare surface as described in "Rubbed Finishes" above.
- P. Mix one part Portland cement and one-half ($\frac{1}{2}$) part fine sand with sufficient water to produce a grout with the consistency of thick paint. Wet surface of

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- concrete to prevent absorption of water from grout, and apply grout uniformly with brushes. Immediately after applying grout mix, scrub the surface with a cork float or stone to coat surface and fill remaining air voids and other remaining surface defects. Remove excess grout by working the surface with rubber float. After the surface whitens from drying, rub with clean burlap. Cure surface for a period of seventy two (72) hours.
- Q. Finishing of Unformed Surfaces: Unless otherwise shown on the Drawings unformed surfaces shall be finished as follows:
1. Slabs: Screed with straightedge to remove low and high spots bringing the surface to the required finish elevation of slope and float with a steel float at least three (3) feet in width. When the concrete has reached its initial set, finish with a steel trowel. Use a steel power trowel for large areas. Leave finish essentially free of trowel marks, uniform in texture and appearance and plane to the correct tolerance. Dusting the surface with dry cement, sand, or sprinkling with water is prohibited.
 2. No wetting of concrete surfaces during slab finishing operations shall be permitted. Further, no concrete finishing operation shall be permitted while there is water on the surface of slabs and other flatwork.
 3. Finishes that are exposed and subject to foot traffic shall receive a broom finish with a texture of plus or minus one-sixteenth (1/16) inch or as designated on the Drawings.
- R. Tops of Walls with Bearings: Strike smooth tops of walls and similar unformed surfaces that shall have bearings or bearing pads, and finish with a steel trowel.
- S. Stairways and Sidewalks: Strike smooth tops of stairs and sidewalks and finish with a light broom providing a texture of plus or minus one-sixteenth (1/16) inch.
- T. Slabs with Waterproofing Membranes: Strike smooth and float finish.
- U. Construction Joint Surfaces: Surface shall be broom or raked finished. Surface shall be water or grit blasted prior to placing additional concrete, such as columns on column footings and column footings on reservoir slabs.

END OF SECTION 03 35 00

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SECTION 03 60 00

GROUTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Portland cement grout materials
2. Grout
3. Formwork
4. Pressure grouting equipment

1.2 SUBMITTALS

A. Product Data:

1. Certificate of Compliance with applicable ASTM requirements for Portland cement and fine aggregate.
2. Manufacturer's technical literature for admixtures indicating compliance with applicable specifications.
3. Grout mix design.
4. Manufacturer's Installation Instructions: Mixing, handling, surface preparation and placing epoxy type and non-shrink type grouts.

1.3 QUALITY ASSURANCE

- A. Tests: The Engineer may sample and test grout materials to check compliance with these specifications.

PART 2 - PRODUCTS

2.1 PORTLAND CEMENT GROUT MATERIALS

- A. Portland Cement: ASTM C150, Type II or Type V, low alkali, containing less than 0.60 percent alkalis.

B. Water:

1. Potable; containing no impurities, suspended particles, algae, or dissolved natural salts in quantities capable of causing:
 - a. Corrosion of steel.
 - b. Volume change increasing shrinkage cracking.

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- c. Efflorescence.
 - d. Excess air entraining.
- C. Water for washing aggregate, for mixing, and for curing shall be free from oil and deleterious amounts of acids, alkalis, and organic materials; shall not contain:
- 1. 1,000 mg/L of chlorides as Cl-
 - 2. 1,300 mg/L of sulfates as SO₄
 - 3. An amount of impurities that may cause a change of more than 25% in the setting time of the cement, nor a reduction of more than 5% in the compressive strength of the grout at 14 days when compared with the result obtained with distilled water.
 - 4. Additionally, water used for curing shall not contain an amount of impurities sufficient to discolor the grout.
- D. Fine Aggregate:
- 1. Fine aggregate shall be hard, dense, durable particles of either natural sand or crushed stone regularly graded.
 - 2. Gradation in accordance with ASTM C33 and represented by smooth granulometric curve within required limits, as modified below:
 - a. When tested in accordance with ASTM C136, gradation shall be such that 100% by weight will pass a standard No. 8 mesh sieve and no less than 45% by weight will pass a standard No. 40 mesh sieve.
 - b. Variation from the specified gradations in individual tests will be acceptable if the average of three consecutive tests is within the specified limits and the variation is 2% or less on US standard sieve sizes 30 or coarser.
 - 3. Aggregate shall be nonreactive and shall be washed before use.
 - 4. When sources of aggregate are changed, test reports shall be provided for the new material. The test specified shall be performed prior to commencing grout work.
 - 5. Other tests shall be in accordance with the following:

Property	Test	Result
Organic Impurities	ASTM C40	Color lighter than standard
Fines	ASTM C117	3% maximum by weight
Soundness	ASTM C88	10% maximum loss with sodium sulfate
Reactivity	ASTM C289	Innocuous aggregate

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Sand Equivalent	CALTEST No. 217	Minimum 80
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E. Admixtures:

1. Admixtures shall be compatible with the grout.
2. Calcium chloride or admixtures containing calcium chloride are not acceptable.
3. Admixtures shall be used in accordance with the manufacturer's recommendations and shall be added separately to the grout mix.
4. Water Reducing Retarder:
 - a. ASTM C494 Type D
 - b. Master Builders Pozzolith 300-R, Sika Corporation Plastiment, or approved equal.
5. Lubricant for cement pressure grouting shall be Intrusion Prepakt Intrusion Aid, Sika Intraplast N, or approved equal.

2.2 GROUT

- A. Cement Grout: Cement grout shall be a mixture of one part cement, two parts sand, proportioned by volume, admixtures for pressure grouting, and Sufficient water to form a workable mix.
- B. Drypack Grout: One part Portland cement and 2 parts fine aggregate, by volume. Grout shall be of a consistency suitable for the intended purpose and shall be used immediately after mixing.
- C. Epoxy Injection Grout: Epoxy grout shall be WR Meadows EG 96, Versaflex FE-100, Simpson's ETI series, or approved equal.
- D. Rapid-Curing Epoxy Grout: High strength, three-component epoxy grout formulated with thermosetting resins and inert fillers. Rapid-curing, high adhesion, and resistant to ordinary chemicals, acids and alkalis.

Property	Test	Result
Compressive Strength	ASTM C579	12,000 psi at 7 days
Tensile Strength	ASTM C307	2,000 psi minimum
Coefficient of Expansion	ASTM C531	0.000030 in per degree F
Shrinkage	ASTM C827	None

E. Non-Shrink Cementitious Grout:

1. Pre-mixed ready for use formulation requiring only addition of water; non-corrosive, non-metallic, non-gas-forming, no chlorides.
2. Shall be Degussa Admixtures, Inc. Masterflow 713 "Plus", Sika Chemical Corporation Sika Grout 212, or approved equal.

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3. Non-shrink grout shall meet the requirements of ASTM C 1107.

F. Properties: Certified to maintain initial placement volume or expand after set and meet following minimum properties when tested according to CRD-C621, for Type D non-shrink grout:

Property	Test	Time	Result
Setting Time	ASTM C191	Initial	2 hours (approx.)
		Final	3 hours (approx.)
Expansion			0.10 - 0.4 percent max.
Compressive Strength	CRD-C621	1 day	4,000 psi
		7 days	7,000 psi
		28 days	10,000 psi to 10,800 psi

2.3 FORMWORK: Refer to Section 03 10 00 – Concrete Forming and Accessories.

2.4 PRESSURE GROUTING EQUIPMENT: Pressure grouting equipment shall include a mixer and holdover agitator tanks and shall be designed to place grout at pressures up to 50 psi. Gauges shall be designed to place grout at pressures up to 50 psi. Gauges shall be provided to indicate pressure used. The mixer shall be provided with a meter capable of indicating to 1/10 of a cubic foot the volume of grout used.

PART 3 - EXECUTION

3.1 PREPARATION

A. Use the following sequence:

1. Remove defective concrete, laitance, dirt, oil, grease and other foreign material from concrete surfaces until sound, clean concrete surface is achieved.
2. Rough concrete lightly, but not enough to interfere with placement of grout.
3. Remove foreign materials from metal surfaces in contact with grout.
4. Align, level, and maintain final positioning of components to be grouted.
5. Blow surfaces to remove dust and fines.
6. Saturate concrete surfaces with clean water; remove excess water, leaving none standing.

3.2 INSTALLATION - FORMWORK

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- A. Construct leakproof forms anchored and shored to withstand grout pressures.
- B. Install formwork with clearances to permit proper placement of grout.

3.3 MIXING

A. Portland Cement Grout:

- 1. Prepare grout with water to obtain consistency to permit placing and packing.
- 2. Pre-mix using approximately 2/3 of water; after partial mixing, add remaining water to bring mix to desired placement consistency and continue mixing 2 to 3 minutes.
- 3. Mix only quantities of grout capable of being placed within 30 minutes after mixing.
- 4. Do not add additional water after grout has been mixed.

B. Mix and prepare rapid curing epoxy grout according to manufacturer's instructions.

C. Mix and prepare non-shrink cementitious grout according to manufacturer's instructions.

D. Mix grout components in proximity to work area and transport mixture quickly and in manner not permitting segregation of materials.

3.4 PLACING GROUT: Grout shall not be placed when ambient temperature is below 40°F or when it is likely that the ambient temperature will fall below 40°F during or within 48 hrs of placement.

A. Dry-pack Grout:

B. Dry-pack grout shall be used for built-up surfaces, setting miscellaneous metal items and minor repairs.

C. Grout used under minor bearing plates shall be dry-pack grout.

D. Surfaces required to be built up with dry-pack grout shall be roughened by brushing, cleaned, and coated with bonding compound specified in Section 03 30 00 - Cast-In-Place Concrete, before the application of the grout.

E. The dry-pack grout shall be applied immediately following the application of the bonding compound in bands or strips to form a covering of the required thickness. The covering shall be smooth.

F. Construction joints in the grout shall be sloped and shall be cleaned and wetted before application is resumed.

G. Dry-pack grout shall be cured in accordance with Section 03 30 00 - Cast-In-Place Concrete.

H. Cement Grout:

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1. Cement grout shall be used for filling nonbearing portions of equipment pads and pressure grouting.
 2. Except for the specialized equipment for pressure grouting, mixing, and placing apparatus shall be similar to that normally used for cast-in-place concrete.
 3. Diluted grout shall be agitated to keep ingredients mixed.
 4. Thoroughly compact final installation and eliminate air pockets.
- I. Non-shrink Grout:
1. Non-shrink grout shall be used for the bearing surfaces of machinery and equipment bases, column baseplates, and bearing plates.
 2. Grout shall be placed in accordance with manufacturer's instructions.
- J. Pressure Grouting:
1. Grouting, once commenced, shall be completed without stoppage. In case of breakdown of equipment, the Contractor shall wash out the grouting system sufficiently to ensure fresh grout and adequate bond and penetration will occur upon restarting the grouting operation.
 2. Grout pressure shall be maintained until grout has set.
- K. Epoxy Grout:
1. Epoxy grout shall be used for repairing cracks by pressure grouting, and repairing structural concrete.
 2. Epoxy grout shall be used for setting bolts and reinforcing steel in holes for grouting.
 3. Concrete shall be primed in accordance with the grout manufacturer's instructions.

3.5 CURING

- A. Immediately after placement, protect grout from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Prevent rapid loss of water from grout during first 48 hours after placement by using approved membrane curing compound or with by using wet burlap method.

3.6 FIELD QUALITY CONTROL

- A. Tests of grout components may be performed to ensure conformance with specified requirements.

END OF SECTION 03 60 00

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SECTION 04 00 00

MASONRY

PART 1 – GENERAL

1.1 REFERENCE STANDARDS

- A. The Brick Industry Association (BIA), 11490 Commerce Park Drive, Reston VA 20191, www.bia.org
- B. National Concrete Masonry Association (NCMA) 13750 Sunrise Valley Drive, Herndon, VA 20171-4662, www.ncma.org
- C. Portland Cement Association (PCA), 5420 Old Orchard Road, Skokie, IL 60077, www.portcement.org
- D. ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA, 19428-2959, www.astm.org
- E. ASTM C216 Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale)
- F. ASTM C652 Standard Specification for Hollow Brick (Hollow Masonry Units Made From Clay or Shale)
- G. ASTM C780 Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
- H. ASTM C270 Standard Specification for Mortar for Unit Masonry
- I. ASTM C1019 Standard Test Method for Sampling and Testing Grout
- J. ASTM C109/C109M Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens)

PART 2 - UNIT MASONRY

- 2.1 CONCRETE MASONRY UNITS: Concrete Masonry Units (CMU): Concrete masonry units shall comply with guidelines established by the National Concrete Masonry Association (NCMA).
 - A. Mortar Type: type “M” or “S” for structural applications.
 - B. Expansion and Control Joints: Expansion joints and control joints shall be detailed and specified to accommodate potential movement that may cause cracking.
 - C. Reinforcing and Grouting: Hollow cells shall be reinforced and grouted per drawings. Test grout per ASTM C 1019.

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2.2 MORTAR

- A. Mortar: Mortar shall be specified based on performance criteria. Mortar specification and construction shall be sensitive to masonry materials especially for repairs or renovations of historic structures. To the extent possible, color shall match existing.
- B. Mortar Joints: Mortar joints shall be tooled slightly concave. Struck or raked joints shall not be used in exterior walls unless required to match the existing joints in historic buildings.
- C. Calcium chloride shall not be added to mortar mixes.
- D. Test mortar per ASTM C780 and C109.

2.3 MASONRY ACCESSORIES

- A. Metal Accessories: Brick ties, plates, fasteners, lintel angles, relieving angles and other metal accessories shall be galvanized steel (minimum G-90) or stainless steel. Flashing: Flashing shall be carefully thought out and positioned. Flashing shall extend beyond openings and have end dams at vertical terminations. Through wall flashing for brick veneer shall extend a minimum of 8-inches above weep location. Coordinate and detail the interface between below grade waterproofing and through- wall flashing, as well as base flashing and weeps. For stone coping and brick masonry veneer above roof areas, through wall flashing shall be fabricated from copper sheet metal and shall have receivers for roof counter flashing. Stainless steel flashing may be used in non-historic areas.
- B. Cavity Walls: Cavity walls shall be specified, detailed and constructed so that cavities drain freely without being obstructed with mortar accumulations in the cavity. Weep media products shall be used where necessary. Brick ties shall be specified with built-in drips to prevent water from bridging the cavity.
- C. Weeps: Weeps shall be installed at all through wall flashing locations in accordance with Brick Institute of America guidelines. Open head joints with honeycomb plastic weep inserts are required rather than cords, tubes or open head joints. Locate through wall flashing and weeps a minimum of 12-inches above adjacent roofs to allow reroofing without interfering with their operation.

PART 3 - QUALITY CONTROL

- 3.1 Pre-Construction Conferences: The Owner may coordinate a preconstruction conference for all new construction and exterior wall renovation projects. Participants should include the Owner's Representative, the Engineer, Contractor, Masonry Installation Contractor, and other related trades representatives.
- 3.2 Mock up panel assembly: At the Owner's discretion, a mock up panel assembly may be required to demonstrate the architectural effects of the CMU construction.

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3.3 Testing: Testing in accordance with the TMS 402 Inspection Requirements

END OF SECTION 04 00 00

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SECTION 04 22 00

CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The Contract Drawings, General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Concrete unit masonry.
 - 2. Reinforced unit masonry.
 - 3. Masonry waste disposal.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 3 Section "Cast In Place Concrete".
 - 2. Division 7 Section "Sheet Metal Flashing and Trim" for exposed sheet-metal flashing installed in masonry.
 - 3. Division 7 Section "Joint Sealants".
 - 4. Division 8 Section "Hollow Metal Doors and Frames".
- C. Products furnished but not installed under this Section include the following:
 - 1. Anchor sections of adjustable masonry anchors for connecting to structural frame installed under Division 5 Section "Structural Steel."
- D. Products installed but not furnished under this Section include the following:
 - 1. Steel shelf angles for unit masonry specified in Division 5 Section "Metal Fabrications."
 - 2. Manufactured reglets in masonry joints for metal flashing specified in Division 7 Section "Flashing and Sheet Metal."
 - 3. Hollow metal frames in unit masonry openings specified in Division 8 Section "Hollow Metal Doors and Frames."

1.3 PERFORMANCE REQUIREMENTS

- A. Provide unit masonry that develops the following installed compressive

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strengths (f'm) at 28 Calendar Days.

1. For Concrete Unit Masonry: As follows, based on net area:
 - a. f'm = 1500 psi.

1.4 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for each different masonry unit, accessory, and other manufactured product specified.
- C. Shop drawings for reinforcing detailing fabrication, bending, and placement of unit masonry reinforcing bars. Comply with ACI 315 "Details and Detailing of Concrete Reinforcement" showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of masonry reinforcement.
- D. Samples for initial selection of the following:
 1. Unit masonry samples in small-scale form showing the full range of colors and textures available for each different exposed masonry unit required.
 2. Colored-masonry mortar samples showing the full range of colors available.
- E. Samples for verification of the following:
 1. Full-size units for each different exposed masonry unit required showing the full range of exposed colors, textures, and dimensions to be expected in the completed construction.
 2. Colored-masonry mortar samples for each color required showing the full range of colors expected in the finished construction. Make samples using the same sand and mortar ingredients to be used on the Project. Label samples to indicate type and amount of colorant used.
 3. Accessories embedded in the masonry.
- F. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to specifically identify exact materials used. Include mix proportions for mortar and grout and source of aggregates.
 1. Submittal is for information purposes only. Neither receipt of list nor acceptance of mockup constitutes approval of deviations from Contract Documents unless such deviations are specifically brought to the attention of the Architect and approved by the City in writing.
- G. Material certificates for the following, signed by manufacturer and Contractor, certifying that each material complies with requirements.

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1. Each different cement product required for mortar and grout, including name of manufacturer, brand, type, and weight slips at time of delivery.
 2. Each material and grade indicated for reinforcing bars.
 3. Each type and size of joint reinforcement.
 4. Each type and size of anchors, ties, and metal accessories.
- H. Material test reports from a qualified independent testing agency, employed and paid by Contractor or manufacturer, indicating and interpreting test results relative to compliance of the following proposed masonry materials with requirements indicated:
1. Mortar complying with property requirements of ASTM C 270.
 2. Grout mixes. Include description of type and proportions of grout ingredients.
 3. Masonry units.
- I. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- 1.5 QUALITY ASSURANCE
- A. Contractor shall employ and pay a qualified professional engineer to provide a survey and inspection of foundations for compliance with dimensional tolerances.
- B. Testing Agency Qualifications: To qualify for acceptance, an independent testing agency must demonstrate to Architect's satisfaction, based on evaluation of agency-submitted criteria conforming to ASTM C 1093, that it has the experience and capability to satisfactorily conduct the testing indicated without delaying the Work.
- C. Preconstruction Testing: Employ and pay a qualified independent testing agency to perform the following preconstruction testing to establish compliance of proposed materials and construction with specified requirements:
1. Concrete Masonry Unit Test: For each different concrete masonry unit indicated, test units for strength, absorption, and moisture content per ASTM C 140.
 2. Prism Test: For each type of wall construction indicated, test masonry prisms per ASTM E 447, Method B.
 3. Test mortar properties per test methods of ASTM C 270.
 4. Evaluate mortar composition and properties per ASTM C 780.
 5. Test grout compressive strength per ASTM C 1019.

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- D. Single-Source Responsibility for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one source and by a single manufacturer for each different product required.
 - E. Single-Source Responsibility for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.
 - F. Mockup: Prior to installing unit masonry, construct sample wall panels to verify selections made under sample submittals and to demonstrate aesthetic effects of materials and execution. Build full scale mockups to comply with the following requirements, using materials indicated for final unit of Work.
 - 1. Locate mockups on site in the locations indicated or, if not indicated, as directed by Architect.
 - 2. Build mockup of typical wall area as shown on Drawings.
 - 3. Clean exposed faces of mockups with masonry cleaner indicated.
 - 4. Notify Architect one week in advance of the dates and times when mockups will be constructed.
 - 5. Protect accepted mockups from the elements with weather-resistant membrane.
 - 6. Retain and maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - a. Acceptance of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by Architect in writing.
 - b. Acceptance of mockups does not constitute approval of deviations from the Contract Documents contained in mockups, unless such deviations are specifically approved by Architect in writing.
 - c. When directed, demolish and remove mockups from Project site.
 - G. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Management Coordination".
 - H. Continuous special inspection is required for all masonry work on this job refer to Structural General Notes.
- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. Store masonry units on elevated platforms, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do

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not install until they are in an air-dried condition.

- B. Store cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.7 PROJECT CONDITIONS

- A. Do not apply uniform floor or roof loads for at least seven (7) Calendar Days and concentrated loads for at least fourteen (14) Calendar Days after building masonry walls or columns.
- B. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect base of walls from rain-splashed mud and mortar splatter by coverings spread on ground and over wall surface.
 - 2. Protect sills, ledges, and projections from mortar droppings.
 - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt on completed masonry.
- C. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit masonry damaged by frost or freezing conditions. Comply with the following requirements:
 - 1. Cold-Weather Construction: When the ambient temperature is within the limits indicated, use the following procedures:
 - a. 40 to 32 deg F: Heat mixing water or sand to produce mortar temperatures between 40 and 120 deg F.
 - b. 32 to 25 deg F: Heat mixing water and sand to produce mortar temperatures between 40 and 120 deg F. Heat grout materials to produce grout temperatures between 40 and 120 deg F. Maintain mortar and grout above freezing until used in masonry.
 - 2. Cold-Weather Protection: When the mean daily temperature is within the limits indicated, provide the following protection:
 - a. 40 to 25 deg F: Cover masonry with a weather-resistant membrane for 48 hours after construction.
 - 3. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until masonry has

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dried out, but not less than seven (7) Calendar Days after completion of cleaning.

- D. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100 deg F and above.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements. Must be approved in writing by the Architect.

2.2 CONCRETE MASONRY UNITS

- A. General: Provide shapes indicated and as follows for each form of concrete masonry unit required.

1. Provide special shapes for lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.
2. Provide square-edged units for outside corners, except where indicated as bullnose.

- B. Concrete Masonry Units: ASTM C 90 and as follows:

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength indicated below:
 - a. 1900 psi average of three units, 1700 psi individual unit.
2. Weight Classification: Medium weight (78 psf, fully grouted).
3. Provide Type I, moisture-controlled units.
4. Size: Manufactured to the actual dimensions listed below (within tolerances specified in the applicable referenced ASTM specification) for the corresponding nominal sizes indicated on Drawings:
 - a. 6 inch nominal: 5-5/8 inch actual.
 - b. 8 inch nominal: 7-5/8 inch actual.
 - c. 16 inch nominal: 15-5/8 inch actual.
5. Exposed Faces:
 - a. As identified on wall schedule to include but not limited to the following:
 1. Split-Face from Manufacturer's full color range.
 2. Ground Face from Manufacturer's full color range.

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3. Precision Face from Manufacturer's full color range.
4. Shot Blast Face from Manufacturer's full color range.
5. Glazed Face from Manufacturer's full color range.

a. Where units are to be left exposed, provide color and texture matching the range represented by Architect's sample.

2.3 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- B. Mortar Cement: ASTM C270
 1. For pigmented mortars, use premixed, colored mortar cements of formulation required to produce color indicated, or if not indicated, as selected from manufacturer's standard formulations. Pigments shall not exceed 5 percent of mortar cement by weight for mineral oxides nor 1 percent for carbon black.
 2. For colored-aggregate mortars, use mortar cement of natural color or white as required to produce mortar color indicated.
- C. Hydrated Lime: ASTM C 207, Type S and U.B.C. Standard 21-13.
- D. Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207.
 1. For pigmented mortars, use colored portland cement-lime mix of formulation required to produce color indicated, or if not indicated, as selected from manufacturer's standard formulations. Pigments shall not exceed 10 percent of portland cement by weight for mineral oxides nor 2 percent for carbon black.
- E. Aggregate for Mortar: ASTM C 144; except for joints less than 1/4 inch, use aggregate graded with 100 percent passing the No. 16 sieve.
 1. White-Mortar Aggregates: Natural white sand or ground white stone.
 2. Colored-Mortar Aggregates: Natural-colored sand or ground marble, granite, or other sound stone, as required to match Architect's sample.
- F. Aggregate for Grout: ASTM C 404.
- G. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortars.
- H. Ready-Mixed Mortar: Cementitious materials, water, and aggregate complying with requirements specified in this Article; combined with set-controlling

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admixtures to produce a ready-mixed mortar complying with ASTM C 1142.

- I. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494, Type C, and recommended by the manufacturer for use in masonry mortar of composition indicated.
- J. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMU, containing integral water repellent by same manufacturer.
- K. Water: Potable.
- L. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Colored Masonry Cement:
 - a. Brixment-in-Color; Essroc Materials, Inc.; or approved equal.
 - b. Centurion Colorbond; Lafarge Corporation; or approved equal.
 - c. Lehigh Custom Color Masonry Cement; Lehigh Portland Cement Co.; or approved equal.
 - d. Flamingo Color Masonry Cement; Riverton Corporation (The); approved equal.
 - 2. Colored Portland Cement-Lime Mix:
 - a. Color Mortar Blend; Glen-Gery Corporation; or approved equal.
 - b. Centurion Colorbond PL; Lafarge Corporation; or approved equal.
 - c. Lehigh Custom Color Portland/Lime; Lehigh Portland Cement Co.; or approved equal.
 - d. Riverton Portland Cement Lime Custom Color; Riverton Corporation (The).; or approved equal.
 - 3. Mortar Pigments:
 - a. True Tone Mortar Colors; Davis Colors; or approved equal.
 - b. Centurion Pigments; Lafarge Corporation; or approved equal.
 - c. SGS Mortar Colors; Solomon Grind-Chem Services, Inc.; or approved equal.
 - 4. Cold-Weather Admixture:
 - a. Accelguard 80; Euclid Chemical Co.
 - b. Morset; Grace: W.R. Grace & Co.
 - c. Or Approved Equal
 - 5. Water-Repellent Admixture:
 - a. Dry-Block Mortar Admixture; Grace: W.R. Grace & Co.
 - b. Or Approved Equal

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6. SIKA Grout Aid II is required for all high lift grout construction or Approved Equal.

2.4 REINFORCING STEEL

- A. Steel Reinforcing Bars: Refer to General Notes on Drawing Sheet S1.01 Reinforcing Steel for Concrete & Masonry. "Reinforcing Materials".

2.5 MASONRY CLEANERS

- A. Job-Mixed Detergent Solution: Solution of 1/2-cup dry measure tetrasodium polyphosphate and 1/2-cup dry measure laundry detergent dissolved in 1 gal. of water.
- B. Proprietary Acidic Cleaner: Manufacturer's standard-strength, general-purpose cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry surfaces of type indicated below without discoloring or damaging masonry surfaces; expressly approved for intended use by manufacturer of masonry units being cleaned.

1. For masonry not subject to metallic oxidation stains, use formulation consisting of a concentrated blend of surface-acting acids, chelating, and wetting agents.
2. For dark-colored masonry not subject to metallic oxidation stains, use formulation consisting of a liquid blend of surface-acting acids and special inhibitors.
3. For masonry subject to metallic oxidation stains, use formulation consisting of a liquid blend of organic and inorganic acids and special inhibitors.
4. Products: Subject to compliance with requirements, provide one of the following:
 - a. 202 New Masonry Detergent; Diedrich Technologies, Inc.
 - b. 200 Lime Solv; Diedrich Technologies, Inc.
 - c. 202V Vana-Stop; Diedrich Technologies, Inc.
 - d. Sure Klean No. 600 Detergent; ProSoCo, Inc.
 - e. Sure Klean No. 101 Lime Solvent; ProSoCo., Inc.
 - f. Sure Klean Vana Trol; ProSoCo, Inc.

2.6 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
1. Do not use calcium chloride in mortar or grout.
 2. Add cold-weather admixture (if used) at the same rate for all mortar, regardless of weather conditions, in order to ensure that mortar color is

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consistent.

- B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification, for types of mortar indicated below:
 - 1. For reinforced masonry and where indicated, use type indicated below:
 - a. Type: S having a minimum comprehensive strength of 1800 psi.
- D. Pigmented Mortar: Select and proportion pigments with other ingredients to produce color required.
 - 1. Limit pigments to the following percentages of cement content by weight:
 - a. For mineral oxide pigments and masonry cement mortar, not more than 5 percent.
 - b. For carbon-black pigment and masonry cement mortar, not more than 1 percent.
- E. Colored-Aggregate Mortar: Produce required mortar color by using colored aggregates combined with selected cementitious materials.
 - 1. Mix to match Architect's sample.
- F. Grout for Unit Masonry: Comply with ASTM C476. Use grout of consistency indicated or, if not otherwise indicated, of consistency (fine or coarse) at time of placement that will completely fill spaces intended to receive grout.
 - 1. Use fine grout in grout spaces less than 2 inches in horizontal dimension, unless otherwise indicated.
 - 2. Use coarse grout in grout spaces 2 inches or more in least horizontal dimension, unless otherwise indicated.
 - 3. Grout shall have a minimum compressive strength of 2000 at 28 Calendar Days.

2.7 SOURCE QUALITY CONTROL

- A. The Contractor shall employ and pay a qualified independent testing agency to perform the following testing for source quality control. Retesting of materials failing to meet specified requirements shall be done at Contractor's expense.
- B. Concrete Masonry Unit Tests: For each type of concrete masonry unit indicated, units will be tested for strength, absorption, and moisture content per ASTM C 140.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of unit masonry. Do not proceed with installation until unsatisfactory conditions have

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been corrected.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of unit masonry.

B. Examine rough-in and built-in construction to verify actual locations of piping connections prior to installation.

3.2 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to the full thickness shown. Build single-wythe walls to the actual thickness of the masonry units, using units of thickness indicated.

B. Build chases and recesses to accommodate items specified in this and other Sections of the Specifications.

C. Leave openings for equipment to be installed before completion of masonry. After installing equipment, complete masonry to match construction immediately adjacent to the opening.

D. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full-size units without cutting, where possible. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

E. Mix units for exposed unit masonry from several pallets or cubes as they are placed to produce uniform blend of colors and textures.

3.3 CONSTRUCTION TOLERANCES

A. Variation from Plumb: For vertical lines and surfaces of columns, walls, and arises, do not exceed 1/4 inch in 10 feet, nor 3/8 inch in 20 feet, nor 1/2 inch in 40 feet or more. For external corners, expansion joints, control joints, and other conspicuous lines, do not exceed 1/4 inch in 20 feet, nor 1/2 inch in 40 feet or more. For vertical alignment of head joints, do not exceed plus or minus 1/4 inch in 10 feet, nor 1/2 inch maximum.

B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines, do not exceed 1/4 inch in 20 feet, nor 1/2 inch in 40 feet or more. For top surface of bearing walls, do not exceed 1/8 inch in 10 feet, nor 1/16 inch within width of a single unit.

C. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls, and partitions, do not exceed 1/2 inch in 20 feet, nor 3/4 inch in 40 feet or more.

D. Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 1/4 inch nor plus 1/2 inch.

E. Variation in Mortar-Joint Thickness: Do not vary from bed-joint thickness

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indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch. Do not vary bed-joint thickness from bed-joint thickness of adjacent course by more than 1/8 inch. Do not vary from head-joint thickness indicated by more than plus or minus 1/8 inch. Do not vary head-joint thickness from adjacent head-joint thickness by more than 1/8 inch. Do not vary from collar-joint thickness indicated by more than minus 1/4 inch or plus 3/8 inch.

3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurate locating of openings, movement-type joints, returns, and offsets. Avoid the use of less-than-half-size units at corners, jambs, and where possible at other locations.
- B. Lay walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other construction.
- C. Bond Pattern for Exposed Masonry: Lay exposed masonry in the following bond pattern; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
- D. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches. Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
- E. Stopping and Resuming Work: In each course, rack back 1/2-unit length for one-half running bond or 1/3-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly if required, and remove loose masonry units and mortar prior to laying fresh masonry.
- F. Built-in Work: As construction progresses, build-in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.
- G. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.
 - 1. At exterior frames, insert extruded polystyrene board insulation around perimeter of frame in thickness indicated, but not less than 3/4 inch to act as a thermal break between frame and masonry.
- H. Build nonload-bearing interior partitions full height of story to underside of solid floor or roof structure above and as follows:
 - 1. Install compressible filler in joint between top of partition and underside of structure above.

3.5 MORTAR BEDDING AND JOINTING

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- A. Lay hollow concrete masonry units as follows:
 - 1. With full mortar coverage on horizontal and vertical face shells.
 - 2. Bed webs in mortar in all courses.
 - 3. Maintain joint widths indicated, except for minor variations required to maintain bond alignment. If not indicated, lay walls with 3/8-inch joints.
- B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated. Confirm with Architect at the time of mock-up acceptance.
- C. Cut joints flush for masonry walls that are to receive plaster or other direct-applied finishes (other than paint), unless otherwise indicated.

3.6 CAVITIES

- A. Keep cavities clean of mortar droppings and other materials during construction. Strike joints facing cavities flush.
 - 1. Use wood strips temporarily placed in cavity to collect mortar droppings. As Work progresses, remove strips, clean off mortar droppings, and replace in cavity.

3.7 CONTROL AND EXPANSION JOINTS

- A. General: Install control and expansion joints in unit masonry where indicated. Build-in related items as the masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement.
- B. Form control joints in concrete masonry as follows:
 - 1. Fit bond-breaker strips into hollow contour in ends of block units on one side of control joint. Fill the resultant core with grout and rake joints in exposed faces.

3.8 LINTELS

- A. Install steel lintels where indicated.
- B. Provide masonry lintels where shown and where openings of more than 24 inches for block size units are shown without structural steel or other supporting lintels.
 - 1. Provide prefabricated or built-in-place masonry lintels. Use specially formed bond beam units with reinforcement bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.
- C. Provide minimum bearing of 8 inches at each jamb, unless otherwise indicated.

3.9 INSTALLATION OF REINFORCED UNIT MASONRY

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- A. Temporary Formwork and Shores: Construct formwork and shores to support reinforced masonry elements during construction.
 - 1. Construct formwork to conform to shape, line, and dimensions shown. Make sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
 - 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.
- B. Grouting: Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.
 - 1. Do not exceed the following pour heights for coarse grout:
 - a. For minimum grout space of hollow unit cells of 3 by 4 inches, pour height of 12 feet.
 - 2. Provide cleanout holes at least 3 inches in least dimension for grout pours over 24 inches in height.
 - a. Provide cleanout holes at each vertical reinforcing bar.
 - 3. Grouted construction shall be in accordance with Article 3.5 of TMS 602/ACI 530.1/ASCE 6.

3.10 FIELD QUALITY CONTROL

- A. The Contractor shall employ and pay a qualified independent testing agency to perform the following testing for field quality control. Retesting of materials failing to meet specified requirements shall be done at the Contractor's expense.
- B. Testing Frequency: Tests and Evaluations listed in this Article will be performed during construction for each 5000 sq. ft. of wall area or portion thereof.
- C. Mortar properties will be tested per property specification of ASTM C 270 and TMS 602/ACI 530.1/ASCE 6.
- D. Mortar composition and properties will be evaluated per ASTM C 780
- E. Grout will be sampled and tested for compressive strength per ASTM C 1019 and TMS 602/ACI 530.1/ASCE 6 .
- F. Prism-Test Method: For each type of wall construction indicated, masonry prisms will be tested per ASTM E 447, Method B, and as follows:
 - 1. A set of five masonry prisms shall be built and tested prior to the start of construction.
 - 2. A set of three prisms shall be built and tested during construction for each 5000 square feet of wall area.

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- G. Evaluation of Quality-Control Tests: In the absence of other indications of noncompliance with requirements, masonry will be considered satisfactory if results from construction quality-control tests comply with minimum requirements indicated.

3.11 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units; install in fresh mortar or grout, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point-up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for application of sealants.
- C. In-Progress Cleaning: Clean unit masonry as Work progresses by dry brushing to remove mortar fins and smears prior to tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
 3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
 4. Wet wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
 5. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2 applicable to type of stain present on exposed surfaces.
- E. Protection: Provide final protection and maintain conditions that ensure unit masonry is without damage and deterioration at time of Substantial Completion.

3.12 MASONRY WASTE DISPOSAL

- A. Recycling: Undamaged, excess masonry materials are Contractor's property and shall be removed from the Project site for his use.
- B. Excess Masonry Waste: Remove excess, clean masonry waste and legally dispose of off City's property.

END OF SECTION 04 22 00

SECTION 06 11 00

WOOD FRAMING

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS: Drawings and general provisions Contract, including General and Supplementary Conditions and other Division 01 Specification Sections apply to work of this section.
- 1.2 DESCRIPTION OF WORK:
 - A. This section includes the following:
 - 1. Framing with dimension lumber
 - 2. Framing with timber members
 - 3. Framing with engineered wood products
 - 4. Roof and Wall sheathing
 - 5. Solid wood decking
 - 6. Rooftop equipment bases and support curbs
 - 7. Wood blocking, cants, and nailers
 - 8. Wood furring and grounds
 - 9. Wood sleepers
 - 10. Plywood backing panels
- 1.3 QUALITY ASSURANCE
 - A. Solid-Sawn Wood Decking: Comply with AITC 112.
 - B. Glue-Laminated Wood Construction: Comply with AITC 190.1
- 1.4 SUBMITTALS
 - A. Material Certificates: Submit, for record, to the Owner, for dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the American Lumber Standards Committee (ALSC) Board of Review.

PART 2 – PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber:
 - 1. DOC PS 20 and applicable rules of grading agencies indicated. If no

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grading agency is indicated, provide lumber that complies with the applicable rules of any rules writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

2. Factory mark each piece of lumber with grade stamp of grading agency.
 3. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
 4. Provide dressed lumber, S4S, unless otherwise indicated.
- B. Engineered Wood Products: Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
1. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated *by comprehensive testing performed by a qualified independent testing agency.*

2.2 PRESERVATIVE TREATED LUMBER, POSTS, AND PILES

- A. Preservative Treatment by Pressure Process: AWPA Use Category 38, Copper Azole, Type B (CA-8), minimum retention of 0.21 pcf for wood not in contact with ground. For wood that is in contact with or buried in the ground (Timber piles for the entry structure and posts for way-finding signage) to have a minimum of .60 pcf retention rating.
- B. Kiln dry lumber after treatment to a maximum moisture content of 19 percent.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat all rough carpentry, unless wood is installed within conditioned space, and the following:
 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 2. Wood sills, sleepers, blocking, furring, and similar concealed members in contact with masonry or concrete.
 3. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 DIMENSION LUMBER FRAMING

- A. Maximum Moisture Content: 19 percent.

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- B. Non-Load-Bearing Interior Partitions: Construction or No. 2 grade of any species.
- C. Framing Other Than Non-Load-Bearing Interior Partitions: No. 2 grade, southern pine (SPIB).

2.4 WOOD SHEATHING

- A. Plywood: OSB sheathing complying with either DOC PS 1 or DOC PS 2; unless otherwise noted on the Construction Documents
- B. Thickness: As indicated.

2.5 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking
 - 2. Nailers
 - 3. Rooftop equipment bases and support curbs
 - 4. Cants
 - 5. Furring
 - 6. Grounds
- B. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 19 percent maximum moisture content of any species.
- C. For concealed boards, provide lumber with 19 percent maximum moisture content and any of the following species and grades:
 - 1. Douglas Fir Larch, No. 2 grade.

2.6 PLYWOOD BACKING PANELS: Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exterior, AC, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

2.7 FASTENERS

- A. General: Provide fasteners of size and type indicated on the Construction Documents that comply with requirements specified.
- B. Galvanize all steel fasteners and connections in accordance with ASTM A153. For fasteners and connections in contact with pressure treated lumber provide a G90 coating. In all other locations, provide a G60 coating.
- C. Bolts: Steel bolts, galvanized, complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.
- D. Stainless Steel Fasteners: Type 316.

2.8 MISCELLANEOUS MATERIALS

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- A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch (25-mm) nominal thickness, compressible to 1/32 inch (0.8 mm); selected from manufacturer's standard widths to suit width of sill members indicated.
- B. Flexible Flashing: Self-adhesive, rubberized-asphalt compound, bonded to a high density, polyethylene film to produce an overall thickness of not less than 0.025 inch (0.6 mm).

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- B. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- C. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- D. Glued-Laminated Construction
 - 1. Lift with padded slings and protect corners with wood blocking.
 - 2. Predrill for fasteners using timber connectors as templates.
 - 3. Dress exposed surfaces to remove planning and surfacing marks.
- E. Metal Framing Anchors: Install metal framing to comply with manufacturer's written instructions.
- F. Do not splice structural members between supports, unless otherwise indicated.
- G. Comply with AWPAC M4 for applying field treatment to cut surfaces of preservative treated lumber.
- H. Wood Structural Panel Installation: Comply with the "Code Plus" installation provisions in APA Form No. E30K, "APA Design/Construction Guide: Residential and Commercial".
- I. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. Table 2304.9.1, "Fastening Schedule," in the California Building Code.

END OF SECTION 06 11 00

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SECTION 06 40 23

INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A This Section includes the following:
 - 1. Plastic-laminate and laminate metal cabinets.
 - 2. Plastic-laminate and laminate metal countertops.
 - 3. Solid Surface Countertops
- B Related Sections include the following:
 - 1. Division 9 Section "Gypsum Board Assemblies".

1.03 DEFINITIONS

- A Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items, unless concealed within other construction before woodwork installation.

1.04 SUBMITTALS

- A Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
 - 1. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
 - 2. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, and other items installed in architectural woodwork.
 - 3. Apply WI-certified compliance label to first page of Shop Drawings.
- B Product Certificates: Signed by manufacturers of woodwork certifying that products furnished comply with requirements.
- C Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- D Provide warranty in accordance with the warranty and/or guarantee requirements stated elsewhere in Contract Documents including, but not limited

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to, Part III: Contract Documents Contract, Part IV: General Conditions, and Division 1 of technical specifications.

1.05 QUALITY ASSURANCE

- A Installer Qualifications: An experienced installer who has completed architectural woodwork similar in material, design, and extent to that indicated for this Project, with a minimum of 3 years' experience, and whose Work has resulted in construction with a record of successful in-service performance.
- B Fabricator Qualifications: A firm experienced in producing architectural woodwork similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production and installation of interior architectural woodwork.
- D Quality Standard: Unless otherwise indicated, comply with WI's "Manual of Millwork" for grades of interior architectural woodwork, construction, finishes, and other requirements.
- E Fire-Test-Response Characteristics: Where fire-retardant materials or products are indicated, provide materials and products with specified fire-test-response characteristics as determined by testing identical products per test method indicated by UL, ITS, or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify with appropriate markings of applicable testing and inspecting agency in the form of separable paper label or, where required by authorities having jurisdiction, imprint on surfaces of materials that will be concealed from view after installation.

1.06 DELIVERY, STORAGE, AND HANDLING

- A Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

1.07 PROJECT CONDITIONS

- A Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and will maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 43 and 70 percent during the remainder of the construction period.

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- C Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed and indicate measurements on Shop Drawings.
 2. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.08 COORDINATION

- A Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

PART 2 - PRODUCTS

2.01 MATERIALS

- A General: Provide materials that comply with requirements of the WIC quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.
- B Thermoset Decorative Overlay: Particleboard complying with ANSI A208.1, Grade M-2, or medium-density fiberboard complying with ANSI A208.2, Grade MD, with surface of thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1.
- C High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated, or if not indicated, as required by woodwork quality standard. Patterns on laminate shall be run horizontally.
1. Manufacturer: UON, Architect shall choose high-pressure decorative laminate colors & patterns from any of the following manufacturers:
 - a) Formica Corporation.
 - b) Wilsonart International; Div. of Premark International, Inc.
 - c) Nevarmar
 - d) Pionite
 - e) Or approved equal
- D Adhesive for Bonding Plastic Laminate: Unpigmented contact cement.

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E Adhesive for Bonding Plastic Laminate: PVA.

F Metal Laminate (where indicated):

1. Manufacturer: Moz Designs, Color and Finish as selected by Architect from Manufacturer's full range, or approved equal.

G. Solid Surface

1. Manufacturer: UON, Architect shall chose solid surface countertop colors & patterns form any of the following manufacturers:
 - a) Formica Corporation.
 - b) Wilsonart International; Div. of Premark International, Inc.
 - c) Nevermar
 - d) Pionite
 - e) Avonite
 - f) Or approved equal

2.02 FIRE-RETARDANT-TREATED MATERIALS

A General: Where indicated, use materials impregnated with fire-retardant chemical formulations indicated by a pressure process or other means acceptable to authorities having jurisdiction to produce products with fire-test-response characteristics specified.

1. Do not use treated material that does not comply with requirements of referenced woodworking standard or that is warped, discolored, or otherwise defective.
2. Use fire-retardant-treatment formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants in solution to distinguish treated material from untreated material.

B Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Comply with AWPA C20 (lumber) and AWPA C27 (plywood), for woodwork items indicated as fire-retardant treated. Use the following treatment type:

1. Exterior Type: Organic-resin-based formulation thermally set in wood by kiln-drying.
2. Interior Type A: Low-hygroscopic formulation.

2.03 CABINET HARDWARE AND ACCESSORIES

A Hardware Standard: Comply with BHMA A156.9 for items indicated by referencing BHMA numbers or items referenced to this standard.

B Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 100 degrees of opening, self-closing.

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- C Wire Pulls: Back mounted, 4 inches (100 mm) long, 5/16 inches (8 mm) in diameter.
 - D Adjustable Shelf Standards and Supports: BHMA A156.9, B04071; with shelf rests, B04081.
 - E Drawer Slides: Accuride, or approved equal, Side-mounted, full-extension, zinc-plated steel drawer slides with steel ball bearings, BHMA A156.9, B05091, and rated for the following loads:
 - 1. Box Drawer Slides: 75 lbf (330 N).
 - 2. File Drawer Slides: 150 lbf (670 N).
 - 3. Pencil Drawer Slides: 45 lbf (200 N).
 - 4. Keyboard Slide: 75 lbf (330 N).
 - F Drawer Locks: BHMA A156.11, E07041.
 - G Grommets for Cable Passage through Countertops: 1-1/4-inch (32-mm) OD, black, molded-plastic grommets and matching plastic caps with slot for wire passage.
 - 1. Product: Subject to compliance with requirements, provide "OG series" by Doug Mockett and Co., Inc., or approved equal.
 - H Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
 - 1. Satin Chromium Plated: BHMA 626 for brass or bronze base; BHMA 652 for steel base.
 - 2. Satin Stainless Steel: BHMA 630.
 - I For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.
 - J Aluminum reveals – 3/4" typ, UON.
- 2.04 INSTALLATION MATERIALS
- A Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.
 - B Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.
- 2.05 FABRICATION, GENERAL
- A Interior Woodwork Grade: Provide Custom grade interior woodwork complying with the referenced quality standard.

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- B Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.
- C Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
 - 1. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members 3/4 Inch (19 mm) Thick or Less: 1/16 inch (1.5 mm).
 - 2. Edges of Rails and Similar Members More Than 3/4 Inch (19 mm) Thick: 1/8 inch (3 mm).
 - 3. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members and Rails: 1/16 inch (1.5 mm).
- D Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible, before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
 - 1. Notify Architect seven (7) calendar days in advance of the dates and times woodwork fabrication will be complete.
 - 2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on Shop Drawings before disassembling for shipment.
- E Shop cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
 - 1. Seal edges of openings in countertops with a coat of varnish.

2.06 PLASTIC-LAMINATE CABINETS

- A Quality Standard: Comply with WI Section 15.
- B WI Construction Style: Style A, Frameless.
- C WI Construction Type: Type I, multiple self-supporting units rigidly joined together.
- D WI Door and Drawer Front Style: Flush overlay.
- E Reveal Dimension: 1/2 inch (13 mm).
- F Laminate Cladding for Exposed Surfaces: High-pressure decorative laminate complying with the following requirements:

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1. Horizontal Surfaces Other Than Tops: HGS.
2. Postformed Surfaces: HGP.
3. Vertical Surfaces: VGS.
4. Edges: HGS .
5. All patterns on laminate shall be run horizontally.

G Materials for Semiexposed Surfaces: Provide surface materials indicated below:

1. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, Grade VGS.
2. Drawer Sides and Backs: Thermoset decorative overlay.
3. Drawer Bottoms: Thermoset decorative overlay.

H Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:

1. Match color, pattern, and finish as indicated by laminate manufacturer's designations for these characteristics.
2. Match Architect's sample.
3. Provide Architect's selections from laminate manufacturer's full range of colors and finishes in the following categories:
 - a) Solid colors.
 - b) Solid colors with core same color as surface.
 - c) Wood grains
 - d) Patterns.

I Provide dust panels of 1/4-inch (6.4-mm) plywood or tempered hardboard above compartments and drawers, unless located directly under tops.

2.07 PLASTIC-LAMINATE COUNTERTOPS

A Quality Standard: Comply with WI Section 16.

B High-Pressure Decorative Laminate Grade: HGS.

C Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:

1. Match color, pattern, and finish as indicated by manufacturer's designations for these characteristics.
2. Match Architect's sample.
3. Provide Architect's selections from manufacturer's full range of colors and

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finishes in the following categories:

- a) Solid colors.
- b) Solid colors with core same color as surface.
- c) Wood grains.
- d) Patterns.

D Grain Direction: Parallel to cabinet fronts, uon.

E Edge Treatment: Same as laminate cladding on horizontal surfaces.

F Core Material: Particleboard or medium-density fiberboard.

G Core Material at Sinks: Particleboard made with exterior glue, medium-density fiberboard made with exterior glue, or exterior-grade plywood.

2.08 SOLID SURFACE COUNTERTOPS

A Quality Standard: Comply with WI Section 16.

B Solid Surface Material

C Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:

1. Match color, pattern, and finish as indicated by manufacturer's designations for these characteristics.
2. Match Architect's sample.
3. Provide Architect's selections from manufacturer's full range of colors and finishes in the following categories:
 - a) Solid colors.
 - b) Solid colors with core same color as surface.
 - c) Wood grains.
 - d) Patterns.

D Grain Direction: Parallel to cabinet fronts, UON

E Edge Treatment: Same as laminate cladding on horizontal surfaces.

PART 3 - EXECUTION

3.01 PREPARATION

A Condition woodwork to average prevailing humidity conditions in installation areas before installation.

B Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and

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backpriming.

3.02 INSTALLATION

- A Quality Standard: Install woodwork to comply with WI Section 26 for the same grade specified in Part 2 of this Section for type of woodwork involved.
- B Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).
- C Scribe and cut woodwork to fit adjoining work, and refinish cut surfaces and repair damaged finish at cuts.
- D Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.
- E Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
 - 1. Install cabinets with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
 - 2. Maintain veneer sequence matching of cabinets with transparent finish.
 - 3. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches (400 mm) o.c. with No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.
- F Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
 - 1. Install countertops with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
 - 2. Secure backsplashes to tops with concealed metal brackets at 16 inches (400 mm) o.c. and to walls with adhesive.
 - 3. Calk space between backsplash and wall with sealant specified in Division 7 Section "Joint Sealants."

3.03 ADJUSTING AND CLEANING

- A Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B Clean, lubricate, and adjust hardware.
- C Clean woodwork on exposed and semi-exposed surfaces. Touch up shop-

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applied finishes to restore damaged or soiled areas.

END OF SECTION 06 40 23

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SECTION 07 21 00

BUILDING INSULATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A This Section includes the following:
 - 1. Exterior cavity wall thermal insulation.
 - 2. Interior cavity wall insulation.
 - 3. Underside of roof deck thermal insulation. (Above suspended ceiling tiles)
 - 4. Recycled Cotton Insulation
- B Related Sections include the following:
 - 1. Division 9 Sections "Gypsum Board Assemblies" for installation in metal-framed assemblies of insulation specified by reference to this Section.

1.03 SUBMITTALS

- A Product Data: For each type of product indicated.
- B Provide warranty in accordance with the warranty and/or guarantee requirements stated elsewhere in Contract Documents including, but not limited to, Part III: Contract Documents Contract, Part IV: General Conditions, and Division 1 of technical specifications.

1.04 QUALITY ASSURANCE

- A Source Limitations: Obtain each type of building insulation through one source.
- B Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - 1. Surface-Burning Characteristics: ASTM E 84.

1.05 DELIVERY, STORAGE, AND HANDLING

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- A Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Glass-Fiber Insulation, Cotton batt where indicated:
 - a) CertainTeed Corporation.
 - b) Johns Manville Corporation.
 - c) Owens Corning.
 - d) Or approved equal

2.02 INSULATING MATERIALS

- A Basis of Design Product: Products are based on the named manufacturer or an approved comparable product and manufacturer. Insulation shall occur at ALL wall and ceiling cavities, whether or not specifically shown on the drawings.
 - 1. Exterior cavity wall thermal insulation: Thermal Batt Insulation, foil faced, R-19, min..
 - 2. Interior cavity wall insulation: Sound Attenuation Batt Insulation, unfaced.(R-13), min. All interior walls are insulated.
 - 3. Thermal insulation at underside of roof deck(Above suspended ceiling tiles): Owens Corning, Thermal Batt Insulation, foil faced, Refer to Mechanical drawings for R-value. Default to R-38 foil faced, if no R-value given.
 - 4. Rigid Insulation Board: 1 ½" thick at membrane roof locations.

2.03 INSULATION FASTENERS

- A Products: Subject to compliance with requirements, provide one of the following:
 - 1. Adhesively Attached, Spindle-Type Anchors:
 - a) AGM Industries, Inc.; Series T TACTOO Insul-Hangers.
 - b) Gemco; Spindle Type.
 - c) Or approved equal.
 - 2. Anchor Adhesives: -

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- a) AGM Industries, Inc.; TACTOO Adhesive.
 - b) Gemco; Tuff Bond Hanger Adhesive.
 - c) Or approved equal
- B Insulation-Retaining Washers: Install at bottom of roof decking, self-locking washers formed from 0.016-inch- (0.41-mm-) thick galvanized steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than 1-1/2 inches (38 mm) square or in diameter.
- C Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates.

PART 3 - EXECUTION

3.01 EXAMINATION

- A Examine substrates and conditions, with Installer present, for compliance with requirements for Sections in which substrates and related work are specified and other conditions affecting performance.
- B Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A Clean substrates of substances harmful to insulations or vapor retarders, including removing projections capable of puncturing vapor retarders or of interfering with insulation attachment.

3.03 INSTALLATION, GENERAL

- A Comply with insulation manufacturer's written instructions applicable to products and application indicated.
- B Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice and snow.
- C Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D Water-Piping Coordination: If water piping is located on inside of insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.
- E Apply single layer of insulation to produce thickness indicated, unless multiple layers are otherwise shown or required to make up total thickness.

3.04 INSTALLATION OF GENERAL BUILDING INSULATION

- A Apply insulation units to substrates by method indicated, complying with

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manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

- B Set vapor-retarder-faced units with vapor retarder to warm side of construction, unless otherwise indicated. Do not obstruct ventilation spaces, except for firestopping.
 - 1. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation.
- C Install insulation on roof decking substrates by adhesively attached, spindle-type insulation anchors as follows:
 - 1. Fasten insulation anchors to substrates with insulation anchor adhesive according to anchor manufacturer's written instructions. Space anchors according to insulation manufacturer's written instructions for insulation type, thickness, and application indicated.
 - 2. After adhesive has dried, install insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation below indicated thickness.

3.05 PROTECTION

- A Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07 21 00

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SECTION 07 41 13

METAL ROOF PANELS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A This Section includes the following:
 - 1. Factory-formed and field-assembled, standing-seam metal roof panels.
- B Related Sections include the following:
 - 1. Division 7 Section "Metal Wall Panels" for factory-formed metal soffit panels.
 - 2. Division 7 Section "Sheet Metal Flashing and Trim" for fasciae, copings, flashings and other sheet metal work not part of metal roof panel assemblies.
 - 3. Division 7 Section "Joint Sealants" for field-applied sealants not otherwise specified in this Section.

1.03 DEFINITIONS

- A Metal Roof Panel Assembly: Metal roof panels, attachment system components, miscellaneous metal framing, thermal insulation, and accessories necessary for a complete weathertight roofing system.

1.04 PERFORMANCE REQUIREMENTS

- A General: Provide metal roof panel assemblies that comply with performance requirements specified as determined by testing manufacturers' standard assemblies similar to those indicated for this Project, by a qualified testing and inspecting agency.
- B Thermal Movements: Provide metal roof panel assemblies that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

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1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.05 SUBMITTALS

- A Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal roof panel and accessory.
- B Shop Drawings: Show fabrication and installation layouts of metal roof panels; details of edge conditions, joints, panel profiles, corners, anchorages, trim, flashings, closures, and accessories; and special details.
 1. Accessories: Include details of the following items:
 - a) Flashing and trim.
 - b) Gutters.
 - c) Downspouts.
- C Provide warranty in accordance with this specification section, in addition to the warranty and/or guarantee requirements stated elsewhere in Contract Documents including, but not limited to, Part III: Contract Documents Contract, Part IV: General Conditions, and Division 1 of technical specifications.

1.06 QUALITY ASSURANCE

- A Source Limitations: Obtain each type of metal roof panels through one source from a single manufacturer.
- B Product Options: Drawings indicate size, profiles, and dimensional requirements of metal roof panels and are based on the specific system indicated.
 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

1.07 DELIVERY, STORAGE, AND HANDLING

- A Deliver components, sheets, metal roof panels, and other manufactured items so as not to be damaged or deformed. Package metal roof panels for protection during transportation and handling.
- B Unload, store, and erect metal roof panels in a manner to prevent bending, warping, twisting, and surface damage.
- C Stack metal roof panels on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal roof panels to ensure dryness. Do not store metal roof panels in contact with other materials that might cause staining, denting, or other surface damage.

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- D Protect strippable protective covering on metal roof panels from exposure to sunlight and high humidity, except to extent necessary for period of metal roof panel installation.

1.08 PROJECT CONDITIONS

- A Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal roof panels to be performed according to manufacturers' written instructions and warranty requirements.
- B Field Measurements: Verify locations of roof framing and roof opening dimensions by field measurements before metal roof panel fabrication and indicate measurements on Shop Drawings.

1.09 WARRANTY

- A Provide warranty in accordance with this specification section, in addition to the warranty and/or guarantee requirements stated elsewhere in Contract Documents including, but not limited to, Part III: Contract Documents Contract, Part IV: General Conditions, and Division 1 of technical specifications.
- B Warranty: Provide manufacturer's written warranty in which manufacturer agrees to repair or replace Metal Roof Panels that fail in materials or workmanship within specified warranty period twenty (20) years. Manufacturer may not disclaim any implied warranty such as merchantability or fitness for a particular purpose. Both the expressed and implied terms of the warranty shall be read together for the benefit of the City.
- C Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal roof panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Finish Warranty Period: 20 years from date of Project Acceptance, with no dollar limit.

PART 2 - PRODUCTS

2.01 UNDERLAYMENT MATERIALS

- A Felts: ASTM D 226, Type II (No. 30), asphalt-saturated organic felts.
- B Slip Sheet: Building paper, minimum 5 lb/100 sq. ft. (0.24 kg/sq. m), rosin sized.

2.02 MISCELLANEOUS MATERIALS

- A Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide exposed fasteners with heads matching color of metal roof panels by means of plastic caps or factory-applied coating.

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1. Fasteners for Roof Panels: Self-drilling or self-tapping, zinc-plated, hex-head carbon-steel screws, with a stainless-steel cap or zinc-aluminum-alloy head and EPDM or neoprene sealing washer.
- B Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.03 CONCEALED-FASTENER, LAP-SEAM METAL ROOF PANELS

- A General: Provide factory-formed metal roof panels designed to be field assembled by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners and factory-applied sealant in side laps. Include accessories required for weathertight installation.
- B Standing-Seam-Profile, Concealed-Fastener Metal Roof Panels: Formed with raised, curved-top, standing-seam-shaped major rib at panel edge and intermediate stiffening ribs symmetrically spaced between major rib and panel edge.
 1. Material: Aluminum-zinc alloy-coated steel sheet, 0.0159 inch to 0.0209 inch thick. 24 ga. *Design Span* as Manufactured by AEP Span, or approved equal.
 - a) Exterior Finish: Kynar.
 - b) Color: As selected by Architect from manufacturer's full range.
 2. Panel Coverage: +/-16-18" inches (406 mm)
 3. Panel Height: 1.750 inch (25 mm)
 4. Uplift Rating: UL 30.

2.04 ACCESSORIES

- A Roof Panel Accessories: Provide components required for a complete metal roof panel assembly including trim, copings, fasciae, corner units, ridge closures, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels, unless otherwise indicated.
 1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal roof panels.
 2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
- B Flashing and Trim: Formed from 0.0179-inch- (0.45-mm-) thick, zinc-coated (galvanized) steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to,

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eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal roof panels.

- C Gutters: Formed from 0.0179-inch- thick, zinc-coated (galvanized) steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch- long sections, sized according to SMACNA's "Architectural Sheet Metal Manual." Provide 7" deep by 4" wide gutters min. Furnish gutter supports spaced 48 inches o.c., fabricated from same metal as gutters. Provide bronze, copper, or aluminum wire ball strainers at outlets. Finish gutters to match roof fascia and rake trim.

2.05 FABRICATION

- A General: Fabricate and finish metal roof panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- C Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of item indicated.
 - 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 - 2. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
 - 3. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 - 4. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended by metal roof panel manufacturer.

2.06 FINISHES, GENERAL

- A Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable.

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Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.01 EXAMINATION

- A Examine roughing-in for components and systems penetrating metal roof panels to verify actual locations of penetrations relative to seam locations of metal roof panels before metal roof panel installation.
- B Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A Clean substrates of substances harmful to insulation, including removing projections capable of interfering with insulation attachment.
- B Install flashings and other sheet metal to comply with requirements specified in Division 7 Section "Sheet Metal Flashing and Trim."

3.03 UNDERLAYMENT INSTALLATION

- A Felt Underlayment: Install felt underlayment and building-paper slip sheet on roof sheathing under metal roof panels, unless otherwise recommended by metal roof panel manufacturer. Use adhesive for temporary anchorage, where possible, to minimize use of mechanical fasteners under metal roof panels. Apply at locations indicated below, in shingle fashion to shed water, with lapped joints of not less than 2 inches (50 mm).
 - 1. Apply from eave to ridge.
- B Apply slip sheet over underlayment before installing metal roof panels.

3.04 METAL ROOF PANEL INSTALLATION, GENERAL

- A General: Provide metal roof panels of full length from eave to ridge, unless otherwise indicated or restricted by shipping limitations. Anchor metal roof panels and other components of the Work securely in place, with provisions for thermal and structural movement.
 - 1. Field cutting of metal roof panels by torch is not permitted.
 - 2. Flash and seal metal roof panels with weather closures at eaves, rakes, and at perimeter of all openings. Fasten with self-tapping screws.
 - 3. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
 - 4. Lap metal flashing over metal roof panels to allow moisture to run over and off the material.

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B Fasteners:

1. Steel Roof Panels: Use stainless-steel fasteners for surfaces exposed to the exterior and galvanized steel fasteners for surfaces exposed to the interior.

C Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal roof panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by metal roof panel manufacturer.

1. Seal metal roof panel end laps with double beads of tape or sealant, full width of panel. Seal side joints where recommended by metal roof panel manufacturer.

3.05 FIELD-ASSEMBLED METAL ROOF PANEL INSTALLATION

A Standing-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended by manufacturer.

1. Install clips to supports with self-tapping fasteners.
2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
3. Snap Joint: Nest standing seams and fasten together by interlocking and completely engaging factory-applied sealant.

B Fascia Panels: Align bottom of panels and fasten with blind rivets, bolts, or self-tapping screws. Flash and seal panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.

3.06 ACCESSORY INSTALLATION

A General: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal roof panel assembly including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.

B Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install Work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and

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trim to fit substrates and to result in waterproof and weather-resistant performance.

2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

- C Gutters: Join sections with riveted and soldered or lapped and sealed joints. Attach gutters to eave with gutter hangers spaced not more than 4 feet (1.2 m) o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.

3.07 FIELD QUALITY CONTROL

- A Remove and replace applications of metal roof panels where inspections indicate that they do not comply with specified requirements.

3.08 CLEANING AND PROTECTION

- A Remove temporary protective coverings and strippable films, if any, as metal roof panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal roof panel installation, clean finished surfaces as recommended by metal roof panel manufacturer. Maintain in a clean condition during construction.
- B Replace metal roof panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 41 13

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SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A This Section includes the following sheet metal flashing and trim:
 - 1. Manufactured reglets.
 - 2. Formed roof drainage system.
 - 3. Formed low-slope roof flashing and trim.
 - 4. Formed wall flashing and trim.
 - 5. Formed equipment support flashing.
- B Related Sections include the following:
 - 1. Division 7 Section "Metal Wall Panels" for factory-formed metal wall panels and flashing and trim not part of sheet metal flashing and trim.
 - 2. Division 7 Section "Metal Roof Panels" " for installing sheet metal flashing and trim integral with roofing membrane.
 - 3. Division 7 Section "Joint Sealants" for field-applied sheet metal flashing and trim sealants.

1.03 PERFORMANCE REQUIREMENTS

- A General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing, rattling, leaking, and fastener disengagement.
- B Thermal Movements: Provide sheet metal flashing and trim that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of sheet metal and trim thermal movements. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F

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(100 deg C), material surfaces.

- C Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior.

1.04 SUBMITTALS

- A Shop Drawings: Show layouts of sheet metal flashing and trim, including plans and elevations. Distinguish between shop- and field-assembled Work. Include the following:
 1. Identify material, thickness, weight, and finish for each item and location in Project.
 2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
 3. Details for fastening, joining, supporting, and anchoring sheet metal flashing and trim, including fasteners, clips, cleats, and attachments to adjoining Work.
 4. Details of expansion-joint covers, including showing direction of expansion and contraction.
- B Provide warranty in accordance with the warranty and/or guarantee requirements stated elsewhere in Contract Documents including, but not limited to, Part III: Contract Documents Contract, Part IV: General Conditions, and Division 1 of technical specifications.

1.05 QUALITY ASSURANCE

- A Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

1.06 DELIVERY, STORAGE, AND HANDLING

- A Deliver sheet metal flashing materials and fabrications undamaged. Protect sheet metal flashing and trim materials and fabrications during transportation and handling.
- B Unload, store, and install sheet metal flashing materials and fabrications in a manner to prevent bending, warping, twisting, and surface damage.
- C Stack materials on platforms or pallets, covered with suitable weathertight and ventilated covering. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.

1.07 COORDINATION

- A Coordinate installation of sheet metal flashing and trim with interfacing and adjoining construction to provide a leakproof, secure, and noncorrosive installation.

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PART 2 - PRODUCTS

2.01 SHEET METALS

- A Aluminum Sheet: ASTM B 209 (ASTM B 209M), Alloy 3003, 3004, 3105, or 5005, Temper suitable for forming and structural performance required, but not less than H14, finished as follows:
 - 1. Mill Finish: Standard one-side bright.
- B Zinc-Tin Alloy-Coated Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304, dead-soft, fully annealed stainless-steel sheet, coated on both sides with a zinc-tin alloy (50 percent zinc, 50 percent tin).
 - 1. Product: Subject to compliance with requirements, provide "TCS II" by Follansbee Steel.
- C Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation; structural quality.
- D Lead Sheet: ASTM B 749, Type L51121, copper-bearing lead sheet.

2.02 UNDERLAYMENT MATERIALS

- A Polyethylene Sheet: 6-mil- (0.15-mm-) thick polyethylene sheet complying with ASTM D 4397.
- B Felts: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
- C Slip Sheet: Rosin-sized paper, minimum 3 lb/100 sq. ft. (0.16 kg/sq. m).

2.03 MISCELLANEOUS MATERIALS

- A General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.
- B Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.
 - 1. Exposed Fasteners: Heads matching color of sheet metal by means of plastic caps or factory-applied coating.
 - 2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.
 - 3. Blind Fasteners: High-strength aluminum or stainless-steel rivets.
 - 4. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
- C Solder for Zinc-Tin Alloy-Coated Stainless Steel: ASTM B 32, 100 percent tin.
- D Solder for Lead: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead.

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- E Burning Rod for Lead: Same composition as lead sheet.
- F Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.
- G Elastomeric Sealant: ASTM C 920, elastomeric polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- H Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- I Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
- J Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.04 MANUFACTURED SHEET METAL FLASHING AND TRIM

- A Reglets: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with factory- mitered and -welded corners and junctions.
 1. Material: Galvanized steel, 0.0217 inch (0.55 mm) thick.
 2. Concrete Type: Provide temporary closure tape to keep reglet free of concrete materials, special fasteners for attaching reglet to concrete forms, and guides to ensure alignment of reglet section ends.
 3. Flexible Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
 4. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.

2.05 FABRICATION, GENERAL

- A General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Shop fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication.
- B Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.

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- C Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
 - 1. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
 - 2. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- D Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.
- E Expansion Provisions: Where lapped or bayonet-type expansion provisions in the Work cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with elastomeric sealant concealed within joints.
- F Conceal fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.
- G Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
 - 1. Thickness: As recommended by SMACNA's "Architectural Sheet Metal Manual" for application but not less than thickness of metal being secured.

2.06 ROOF DRAINAGE SHEET METAL FABRICATIONS

- A Parapet Scuppers: Fabricate scuppers of dimensions required with closure flange trim to exterior, 4-inch- (100-mm-) wide wall flanges to interior, and base extending 4 inches (100 mm) beyond cant or tapered strip into field of roof. Fasten gravel guard angles to base of scupper.
 - 1. Fabricate parapet scuppers from the following material:
 - a) Galvanized Steel: 0.0276 inch (0.7 mm) thick.

2.07 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A Copings: Fabricate in minimum 96-inch- (2400-mm-) long, but not exceeding 10-foot- (3-m-) long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Miter corners, seal, and solder or weld watertight.
 - 1. Fabricate copings from the following material:
 - a) Galvanized Steel: 0.0396 inch (1.0 mm).
- B Base Flashing: Fabricate from the following material:
 - 1. Galvanized Steel: 0.0276 inch (0.7 mm).

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- C Counterflashing: Fabricate from the following material:
 - 1. Galvanized Steel: 0.0217 inch (0.55 mm) thick.
- D Flashing Receivers: Fabricate from the following material:
 - 1. Galvanized Steel: 0.0217 inch (0.55 mm) thick.
- E Roof-Penetration Flashing: Fabricate from the following material:
 - 1. Lead: 4.0 lb/sq. ft. (1.6 mm thick), hard tempered.
 - 2. Galvanized Steel: 0.0276 inch (0.7 mm) thick.

2.08 WALL SHEET METAL FABRICATIONS

- A Through-Wall Flashing: Fabricate continuous flashings in minimum 96-inch- (2400-mm-) long, but not exceeding 12 foot (3.6 m) long, sections, under copings, at shelf angles, and where indicated. Fabricate discontinuous lintel, sill, and similar flashings to extend 6 inches (150 mm) beyond each side of wall openings. Form with 2-inch- (50-mm-) high end dams. Fabricate from the following material:
 - 1. Zinc-Tin Alloy-Coated Stainless Steel: 0.015 inch (0.4 mm) thick.

2.09 MISCELLANEOUS SHEET METAL FABRICATIONS

- A Equipment Support Flashing: Fabricate from the following material:
 - 1. Galvanized Steel: 0.0276 inch (0.7 mm) thick.

2.10 FINISHES

- A Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.01 EXAMINATION

- A Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of work.
 - 1. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and

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securely anchored.

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

3.02 INSTALLATION, GENERAL

- A General:** Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
1. Torch cutting of sheet metal flashing and trim is not permitted.
- B Metal Protection:** Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.
1. Coat side of uncoated aluminum and lead sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
 2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene underlayment.
 3. Bed flanges in thick coat of asphalt roofing cement where required for waterproof performance.
- C** Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
- D** Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and elastomeric sealant.
- E** Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
1. Space cleats not more than 12 inches (300 mm) apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
- F** Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with elastomeric sealant concealed within joints.
- G** Fasteners: Use fasteners of sizes that will penetrate substrate not less than 1-

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1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws.

1. Galvanized or Prepainted, Metallic-Coated Steel: Use stainless-steel fasteners.
2. Aluminum: Use aluminum or stainless-steel fasteners.

H Seal joints with elastomeric sealant as required for watertight construction.

1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement either way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."

I Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm) except where pre-tinned surface would show in finished Work.

1. Do not solder aluminum sheet.
2. Pre-tinning is not required for zinc-tin alloy-coated stainless steel and lead.
3. Do not use open-flame torches for soldering. Heat surfaces to receive solder and flow solder into joints. Fill joints completely. Completely remove flux and spatter from exposed surfaces.

J Aluminum Flashing: Rivet or weld joints in uncoated aluminum where necessary for strength.

3.03 ROOF DRAINAGE SYSTEM INSTALLATION

A General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.

B Parapet Scuppers (where occurs): Install scuppers where indicated through parapet. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.

1. Anchor scupper closure trim flange to exterior wall and seal or solder to scupper.

3.04 ROOF FLASHING INSTALLATION

A General: Install sheet metal roof flashing and trim to comply with performance

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requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install Work with laps, joints, and seams that will be permanently watertight.

- B Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.
- C Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints a minimum of 4 inches (100 mm) and bed with elastomeric sealant.
 - 1. Secure in a waterproof manner by means of snap-in installation and sealant or lead wedges and sealant.
- D Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Install flashing as follows:
 - 1. Turn lead flashing down inside vent piping, being careful not to block vent piping with flashing.
 - 2. Seal with elastomeric sealant and clamp flashing to pipes penetrating roof except for lead flashing on vent piping.

3.05 WALL FLASHING INSTALLATION

- A General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

3.06 MISCELLANEOUS FLASHING INSTALLATION

- A Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

3.07 CLEANING AND PROTECTION

- A Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B Clean and neutralize flux materials. Clean off excess solder and sealants.
- C Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain in a clean condition during construction.

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- D Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 62 00

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SECTION 07 92 00

JOINT SEALANTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A This Section includes joint sealants for the applications indicated in the Joint-Sealant Schedule at the end of Part 3.
- B Related Sections include the following:
 - 1. Division 8 Section "Glazing" for glazing sealants.
 - 2. Division 9 Section "Gypsum Board Assemblies" for sealing perimeter joints of gypsum board partitions to reduce sound transmission.
 - 3. Division 9 Section "Ceramic Tile" for sealing tile joints.

1.03 PERFORMANCE REQUIREMENTS

- A Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.
- B Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.04 SUBMITTALS

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

- C Provide warranty in accordance with this specification section, in addition to the warranty and/or guarantee requirements stated elsewhere in Contract Documents including, but not limited to, Part III: Contract Documents Contract, Part IV: General Conditions, and Division 1 of technical specifications.

1.05 QUALITY ASSURANCE

- A Installer Qualifications: Manufacturer's authorized Installer who is approved or licensed for installation of elastomeric sealants required for this Project.

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- B Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.
- C Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.06 PROJECT CONDITIONS

- A Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.
 - 2. When joint substrates are wet.
 - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 - 4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.07 WARRANTY

- A Provide warranty in accordance with the warranty and/or guarantee requirements stated elsewhere in Contract Documents including, but not limited to, Part III: Contract Documents Contract, Part IV: General Conditions, and Division 1 of technical specifications.

- B Warranty: Provide manufacturer's written warranty in which manufacturer agrees to repair or replace elastomeric joint sealants that fail in materials or workmanship within specified warranty period five (5) years from Project acceptance. Manufacturer may not disclaim any implied warranty such as merchantability or fitness for a particular purpose. Both the expressed and implied terms of the warranty shall be read together for the benefit of the City.

- C Warranty: Provide manufacturer's written warranty in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants that fail in materials or workmanship within specified warranty period ten (10) years from Project acceptance. Manufacturer may not disclaim any implied warranty such as merchantability or fitness for a particular purpose. Both the expressed and implied terms of the warranty shall be read together for the benefit of the City.

- D Warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:
 - 1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.

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2. Disintegration of joint substrates from natural causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A Basis of Design Product: The design is based upon Dow Corning products or approved equal.

2.02 MATERIALS, GENERAL

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

2.03 ELASTOMERIC JOINT SEALANTS

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

2.04 ACOUSTICAL JOINT SEALANTS

- A Acoustical Sealant for Concealed Joints: Manufacturer's standard, nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.

1. Products:

- a) Pecora Corporation; BA-98.
- b) Tremco; Tremco Acoustical Sealant.
- c) Or approved equal.

2.05 JOINT-SEALANT BACKING

- A General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B Cylindrical Sealant Backings: ASTM C 1330, Type B (bicellular material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

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2.06 MISCELLANEOUS MATERIALS

- A Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.01 EXAMINATION

- A Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a) Concrete.
 - b) Unglazed surfaces of ceramic tile.
 - 3. Remove laitance and form-release agents from concrete.

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4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a) Metal.
 - b) Glass.
 - c) Prefinished architectural panels,
- B Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.03 INSTALLATION OF JOINT SEALANTS

- A General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
- D Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 1. Do not leave gaps between ends of sealant backings.
 2. Do not stretch, twist, puncture, or tear sealant backings.
 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- E Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 1. Place sealants so they directly contact and fully wet joint substrates.
 2. Completely fill recesses in each joint configuration.

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3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

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

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

3.04 CLEANING

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

3.05 PROTECTION

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

3.06 JOINT-SEALANT SCHEDULE

A Joint-Sealant Application JS-#1: Exterior vertical and horizontal nontraffic construction joints in cast-in-place concrete.

1. Joint Sealant: Dow Corning, #756
2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

B Joint-Sealant Application JS-2#: Exterior butt joints between metal panels.

1. Joint Sealant: Dow Corning, #791 or 795.
2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

C Joint-Sealant Application JS-3#: Exterior vertical joints between different materials.

1. Joint Sealant: Dow Corning, #756 or 790.
2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

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- D Joint-Sealant Application JS-4#: Exterior perimeter joints between adjacent walls and frames of doors windows and louvers.
1. Joint Sealant: Dow Corning, #756.
 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.
- E Joint-Sealant Application JS-#5: Interior perimeter joints of exterior openings.
1. Joint Sealant: Latex sealant.
 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.
- F Joint-Sealant Application JS-#6: Interior joints between plumbing fixtures and adjoining walls, floors, and counters.
1. Joint Sealant: Latex sealant.
 2. Joint-Sealant Color: White.
- G Joint-Sealant Application JS-#7: Perimeter joints between interior wall surfaces and frames of interior doors windows and elevator entrances.
1. Joint Sealant: Dow Corning, #786.
 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range .

END OF SECTION 07 92 00

SECTION 08 11 13

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A This Section includes the following:
 - 1. Steel doors.
 - 2. Steel door frames.
- B Related Sections include the following:
 - 1. Division 8 Section "Finish Hardware".
 - 2. Division 9 Section "Gypsum Board Assemblies".
 - 3. Division 9 Section "Painting".

1.03 DEFINITIONS

- A Steel Sheet Thicknesses: Thickness dimensions, including those referenced in ANSI A250.8, are minimums as defined in referenced ASTM standards for both uncoated steel sheet and the uncoated base metal of metallic-coated steel sheets.

1.04 SUBMITTALS

- A Product Data: For each type of door and frame indicated, include door designation, type, level and model, material description, core description, construction details, label compliance, sound and fire-resistance ratings, and finishes.
- B Shop Drawings: Show the following:
 - 1. Elevations of each door design.
 - 2. Details of doors including vertical and horizontal edge details.
 - 3. Frame details for each frame type including dimensioned profiles.
 - 4. Details and locations of reinforcement and preparations for hardware.
 - 5. Details of each different wall opening condition.
 - 6. Details of anchorages, accessories, joints, and connections.

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- C Door Schedule: Use same reference designations indicated on Drawings in preparing schedule for doors and frames.
 - D Provide warranty in accordance with the warranty and/or guarantee requirements stated elsewhere in Contract Documents including, but not limited to, Part III: Contract Documents Contract, Part IV: General Conditions, and Division 1 of technical specifications.
- 1.05 QUALITY ASSURANCE
- A Steel Door and Frame Standard: Comply with ANSI A 250.8, unless more stringent requirements are indicated.
- 1.06 DELIVERY, STORAGE, AND HANDLING
- A Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish of factory-finished doors and frames.
 - B Inspect doors and frames on delivery for damage, and notify shipper and supplier if damage is found. Minor damages may be repaired provided refinished items match new Work and are acceptable to Architect. Remove and replace damaged items that cannot be repaired as directed.
 - C Store doors and frames at building site under cover. Place units on minimum 4-inch- (100-mm-) high wood blocking. Avoid using nonvented plastic or canvas shelters that could create a humidity chamber. If door packaging becomes wet, remove cartons immediately. Provide minimum 1/4-inch (6-mm) spaces between stacked doors to permit air circulation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Steel Doors and Frames: Ceco Door Products; a United Dominion Company, or approved equal

2.02 MATERIALS

- A Hot-Rolled Steel Sheets: ASTM A 569/A 569M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- B Cold-Rolled Steel Sheets: ASTM A 366/A 366M, Commercial Steel (CS), or ASTM A 620/A 620M, Drawing Steel (DS), Type B; stretcher-leveled standard of flatness.

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- C Metallic-Coated Steel Sheets: ASTM A 653/A 653M, Commercial Steel (CS), Type B, with an A40 (ZF120) zinc-iron-alloy (galvannealed) coating; stretcher-leveled standard of flatness.
- D Electrolytic Zinc-Coated Steel Sheet: ASTM A 591/A 591M, Commercial Steel (CS), Class B coating; mill phosphatized; suitable for unexposed applications; stretcher-leveled standard of flatness where used for face sheets.

2.03 DOORS

- A General: Provide doors of sizes, thicknesses, and designs indicated.
- B Exterior Doors: Provide doors complying with requirements indicated below by referencing ANSI A250.8 for level and model and ANSI A250.4 for physical-endurance level:
 - 1. Level 2 and Physical Performance Level B (Heavy Duty), Model 1 (Full Flush).

2.04 FRAMES

- A General: Provide steel frames for doors, transoms, sidelights, borrowed lights, and other openings that comply with ANSI A250.8 and with details indicated for type and profile. Conceal fastenings, unless otherwise indicated.
- B Frames of 0.053-inch- (1.3-mm-) thick steel sheet for:
 - 1. Door openings wider than 48 inches (1220 mm).
 - 2. Wood doors, unless otherwise indicated.
- C Door Silencers: Except on weather-stripped frames, fabricate stops to receive three silencers on strike jambs of single-door frames and two silencers on heads of double-door frames.
- D Supports and Anchors: Fabricated from not less than 0.042-inch- (1.0-mm-) thick, electrolytic zinc-coated or metallic-coated steel sheet.
- E Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where zinc-coated items are to be built into exterior walls, comply with ASTM A 153/A 153M, Class C or D as applicable.

2.05 FABRICATION

- A General: Fabricate steel door and frame units to comply with ANSI A250.8 and to be rigid, neat in appearance, and free from defects including warp and buckle. Where practical, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at Project site.
- B Exterior Door Construction: For exterior locations and elsewhere as indicated, fabricate doors, panels, and frames from metallic-coated steel sheet. Close top and bottom edges of doors flush as an integral part of door construction or by

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MCKINLEY PARK RENOVATION

addition of 0.053-inch- (1.3-mm-) thick, metallic-coated steel channels with channel webs placed even with top and bottom edges.

- C Core Construction: Manufacturer's standard core construction that produces a door complying with SDI standards.
 - D Clearances for Non-Fire-Rated Doors: Not more than 1/8 inch (3.2 mm) at jambs and heads, except not more than 1/4 inch (6.4 mm) between pairs of doors. Not more than 3/4 inch (19 mm) at bottom.
 - E Single-Acting, Door-Edge Profile: Square edge.
 - F Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."
 - G Fabricate concealed stiffeners, reinforcement, edge channels, louvers, and moldings from either cold- or hot-rolled steel sheet.
 - H Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.
 - I Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier. Comply with applicable requirements in ANSI A250.6 and ANSI A115 Series specifications for door and frame preparation for hardware.
 - 1. For concealed overhead door closers, provide space, cutouts, reinforcement, and provisions for fastening in top rail of doors or head of frames, as applicable.
 - J Frame Construction: Fabricate frames to shape shown.
 - 1. For exterior applications, fabricate frames with mitered or coped and continuously welded corners.
 - 2. Provide welded frames with temporary spreader bars.
 - K Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site.
 - L Locate hardware as indicated on Shop Drawings or, if not indicated, according to ANSI A250.8.
- 2.06 FINISHES
- A Prime Finish: Manufacturer's standard, factory-applied coat of rust-inhibiting primer complying with ANSI A250.10 for acceptance criteria.

PART 3 - EXECUTION

3.01 INSTALLATION

SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION

- A General: Install steel doors, frames, and accessories according to Shop Drawings, manufacturer's data, and as specified.
- B Placing Frames: Comply with provisions in SDI 105, unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
 - 1. Except for frames located in existing walls or partitions, place frames before construction of enclosing walls and ceilings.
 - 2. In existing concrete or masonry construction, provide at least three completed opening anchors per jamb; install adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Set frames and secure to adjacent construction with bolts and masonry anchorage devices.
 - 3. In metal-stud partitions, provide at least three wall anchors per jamb; install adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Attach wall anchors to studs with screws.
 - 4. For openings 90 inches (2286 mm) or more in height, install an additional anchor at hinge and strike jambs.
- C Door Installation: Comply with ANSI A250.8. Fit hollow-metal doors accurately in frames, within clearances specified in ANSI A250.8. Shim as necessary to comply with SDI 122 and ANSI/DHI A115.1G.
 - 1. Smoke-Control Doors: Install to comply with NFPA 105.

3.02 ADJUSTING AND CLEANING

- A Prime-Coat Touchup: Immediately after installation, sand smooth any rusted or damaged areas of prime coat and apply touch up of compatible air-drying primer.
- B Protection Removal: Immediately before final inspection, remove protective wrappings from doors and frames.

END OF SECTION 08 11 13

**SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION**

SECTION 08 12 16

INTERIOR ALUMINUM FRAMES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A This Section includes the following:
 - 1. Aluminum door frames.
 - 2. Aluminum glazing frames.

- B Related Sections include the following:
 - 1. Division 8 Section "Flush Wood Doors."
 - 2. Division 8 Section "Aluminum Framed Entrances and Storefront."
 - 3. Division 8 Section "Finish Hardware."
 - 4. Division 8 Section "Glazing."
 - 5. Division 9 Section "Gypsum Board Assemblies."

1.03 SUBMITTALS

- A Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each product specified.

- B Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of components including hardware, glazing, and glazing stops. Show attachments to other Work.

- C Samples for Verification: For each type of exposed finish required, prepared on Samples of manufacturer's standard sizes and of same thickness and material indicated for the Work. If finishes involve normal color and texture variations, include sample sets showing the full range of variations expected.

SPECIAL PROVISIONS
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- D Provide warranty in accordance with the warranty and/or guarantee requirements stated elsewhere in Contract Documents including, but not limited to, Part III: Contract Documents Contract, Part IV: General Conditions, and Division 1 of technical specifications.

1.04 QUALITY ASSURANCE

- A Installer Qualifications: An experienced installer who has completed interior aluminum framing systems similar in material, design, and extent to those indicated for this Project and whose Work has resulted in construction with a record of successful in-service performance.
- B Manufacturer Qualifications: A firm experienced in manufacturing interior aluminum framing systems similar to those indicated for this Project and with a record of successful in-service performance.
- C Source Limitations: Obtain aluminum frames through one source from a single manufacturer with the capacity and resources to provide products of consistent quality in appearance and physical properties.
- D Product Options: Drawings indicate dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction size. Other manufacturers' products complying with requirements may be considered. Refer to Division 1 Section "Substitution Procedures."
 - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

1.05 DELIVERY, STORAGE, AND HANDLING

- A Deliver frames palleted, wrapped, or crated to provide protection during transit and job storage.
- B Inspect frames on delivery for damage. Minor damages may be repaired provided refinished items match new Work and are approved by Architect; otherwise, remove and replace damaged items as directed.
- C Store frames at building site under cover and as near as possible to final installation location. Do not use covering material that will cause discoloration of aluminum finish.

SPECIAL PROVISIONS
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1.06 PROJECT CONDITIONS

- A Environmental Limitations: Do not install interior aluminum frames until spaces are enclosed and weatherproof; wet work in spaces is complete and dry; flooring, walls, ceilings, and Work above ceilings is complete; and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

- B Field Measurements: Verify interior aluminum frame dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish opening and wall dimensions and note on Shop Drawings that these are not measured dimensions. Proceed with fabricating interior aluminum frames without field measurements. Coordinate wall, floor, and ceiling construction to ensure that actual opening dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A MANUFACTURERS: Subject to compliance with requirements, provide products by the following or approved equivalent:
 - 1. Western Integrated Materials, Inc., Series 300 and 400.
 - 2. Versatrac.
 - 3. Or Approved equal

2.02 Not Used

2.04 MATERIALS

- A Extruded Aluminum: ASTM B 221 alloy 6063-T5 or alloy and temper required to suit structural and finish requirements.

2.05 COMPONENTS

**SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION**

- A General: Provide interior aluminum frame components that comply with dimensions, profiles, and relationships to adjoining Work of components indicated on Drawings.
- B Door Frames: Extruded aluminum, not less than 0.062 inch thick, reinforced for hinges and strikes.
- C Glass Frames: Extruded aluminum, not less than 0.062 inch thick, designed for glass thickness indicated.
- D Trim: Extruded aluminum, not less than 0.062 inch thick, removable snap-in glass stops and door stops without exposed fasteners.

2.06 ACCESSORIES

- A Fasteners: Aluminum, nonmagnetic stainless-steel or other noncorrosive metal fasteners compatible with frames, stops, panels, reinforcement plates, hardware, anchors, and other items being fastened.
- B Door Silencers (Mutes): Manufacturer's standard mohair or vinyl.
- C Glazing Gaskets: Manufacturer's standard extruded or molded plastic, to accommodate glazing.
- D Glazing: As specified in Division 8 Section "Glazing."
- E Hardware: As specified in Division 8 Section "Finish Hardware."

2.07 FABRICATION

- A Machine jambs and prepare for hardware, with concealed reinforcement plates, drilled and tapped as required, and fastened within frame with concealed screws.
- B Provide concealed corner reinforcements and alignment clips for precise butt or mitered connections.
- C Fabricate frames for glass to allow glass replacement without dismantling frame.
- D Fabricate all components to allow secure installation without exposed fasteners.

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2.08 ALUMINUM FINISHES

- A General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- C Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 607.1.

PART 3 - EXECUTION

3.01 EXAMINATION

- A Examine walls, floors, and ceilings for suitable conditions where interior aluminum frames are to be installed.
- B Verify that wall thickness does not exceed standard tolerances allowed by throat size indicated.
- C Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A Comply with frame manufacturer's written installation instructions and approved Shop Drawings.
- B Install frames plumb and square, securely anchored to substrates with fasteners recommended by frame manufacturer.

3.03 CLEANING AND ADJUSTING

- A Clean exposed frames promptly after installation, using cleaning methods recommended by frame manufacturer.
 - 1. Clean and maintain anodized aluminum according to AAMA 609.

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- B Remove and replace frames with damaged finish that cannot be satisfactorily repaired.

3.04 PROTECTION

- A Provide protection required to ensure that framing will be without damage or deterioration on Project Acceptance.

END OF SECTION 08 12 16

SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION

SECTION 08 33 23

OVERHEAD COILING DOORS

PART 1-GENERAL

1.1 RELATED DOCUMENTS: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Related Sections: Division 5 Section "Metal Fabrications" for miscellaneous steel supports.

1.3 PERFORMANCE REQUIREMENTS: Operation Cycles: Provide overhead coiling door components and operators capable of operating for not less than number of cycles indicated for each door. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.

1.4 SUBMITTALS

A. Product Data: For each type and size of overhead coiling door and accessory. Include the following:

1. Construction details, material descriptions, dimensions of individual components, profiles for slats, and finishes.
2. Rated capacities, operating characteristics, electrical characteristics, and furnished accessories.

B. Maintenance Data: For overhead coiling doors to include in maintenance manuals.

C. Provide warranty in accordance with the warranty and/or guarantee requirements stated elsewhere in Contract Documents including, but not limited to, Part III: Contract Documents Contract, Part IV: General Conditions, and Division 1 of technical specifications.

B. QUALITY ASSURANCE

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

B. Source Limitations: Obtain overhead coiling doors from single source from single manufacturer.

C. Obtain operators and controls from overhead coiling door manufacturer.

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PART 2 – PRODUCTS

2.1 DOOR CURTAIN MATERIALS AND CONSTRUCTION

- A. Door Curtains: Fabricate overhead coiling-door curtain of interlocking metal slats, designed to withstand wind loading indicated, in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated, and as follows:
1. Steel Door Curtain Slats: Zinc-coated (galvanized), cold-rolled structural steel sheet; complying with ASTM A 653/A 653M, with G90 (Z275) zinc coating; nominal sheet thickness (coated) of 0.028 inch (0.71 mm) and as required to meet requirements.
 2. Stainless-Steel Door Curtain Slats: ASTM A 666, Type 304; sheet thickness of 0.025 inch (0.64 mm) and as required to meet requirements.
 3. Gasket Seal: Provide insulated slats with manufacturer's standard interior-to-exterior thermal break or with continuous gaskets between slats.
- B. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain.

2.2 LOCKING DEVICES

- A. Slide Bolt: Fabricate with side-locking bolts to engage through slots in tracks for locking by padlock, located on both left and right jamb sides, operable from coil side.

2.3 CURTAIN ACCESSORIES

- A. Push/Pull Handles: Equip each push-up-operated or emergency-operated door with lifting handles on each side of door, finished to match door.
- B. Provide pull-down straps or pole hooks for doors more than 84 inches (2130 mm) high.

2.4 COUNTERBALANCING MECHANISM

- A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected

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to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.

- B. Counterbalance Barrel: Fabricate spring barrel of manufacturer's standard hot-formed, structural-quality, welded or seamless carbon-steel pipe, of sufficient diameter and wall thickness to support rolled-up curtain without distortion of slats and to limit barrel deflection to not more than 0.03 in./ft. (2.5 mm/m) of span under full load.
- C. Spring Balance: One or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Secure ends of springs to barrel and shaft with cast-steel barrel plugs.
- D. Torsion Rod for Counterbalance Shaft: Fabricate of manufacturer's standard cold-rolled steel, sized to hold fixed spring ends and carry torsional load.
- E. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.5 MANUAL DOOR OPERATORS

- A. Equip door with manufacturer's recommended manual door operator unless another type of door operator is indicated.
- B. Crank Operator: Consisting of crank and crank gearbox, steel crank drive shaft, and gear-reduction unit, of type indicated. Size gears to require not more than 25 lbf force to turn crank. Fabricate gearbox to be oil tight and to completely enclose operating mechanism. Provide manufacturer's standard crank-locking device.

2.6 DOOR ASSEMBLY

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Cookson Company.
 - 2. Overhead Door Corporation.
 - 3. Or Approved Equal
- B. Operation Cycles: Not less than 20,000.
- C. Door Curtain Material: Galvanized steel.
- D. Door Curtain Slats: Flat profile slats of 1-1/2-inch center-to-center height.
- E. Curtain Jamb Guides: Galvanized steel. Provide continuous integral wear strips to prevent metal-to-metal contact and to minimize operational noise.
- F. Integral Frame, Hood, and Fascia: Galvanized steel.

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- 1. Mounting: Face of wall
- G. Locking Devices: Equip door with slide bolt for padlock.
- H. Manual Door Operator: Manufacturer's standard crank operator.
 - 1. Provide operator with through-wall shaft operation.
 - 2. Provide operator with manufacturer's standard removable operating arm.
- I. Door Finish:
 - 1. Powder-Coated Finish: Color as selected by Architect from manufacturer's full range.

2.7 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.8 STEEL AND GALVANIZED-STEEL FINISHES: Powder-Coat Finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates areas and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.
- B. Examine locations of electrical connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install overhead coiling doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.
- B. Install overhead coiling doors, hoods, and operators at the mounting locations indicated for each door.
- C. Accessibility: Install overhead coiling doors, switches, and controls along accessible routes in compliance with regulatory requirements for accessibility.

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D. Smoke-Control Doors: Install according to NFPA 80 and NFPA 105.

3.3 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
- B. Perform installation and startup checks according to manufacturer's written instructions.
- C. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.4 ADJUSTING

- A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.
- B. Lubricate bearings and sliding parts as recommended by manufacturer.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train City's maintenance personnel to adjust, operate, and maintain overhead coiling doors.

END OF SECTION 08 33 23

SECTION 08 41 10

ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A This Section includes the following:

- 1. Exterior aluminum-framed storefronts.
 - a) Glazing is retained mechanically with gaskets on four sides.
- 2. Exterior manual-swing aluminum doors.

- B Related Sections include the following:

- 1. Division 7 Section "Joint Sealants" for installation of joint sealants installed with aluminum-framed systems and for sealants to the extent not specified in this Section.
- 2. Division 8 Section "Door Hardware" for hardware to the extent not specified in this Section.
- 3. Division 8 Section "Glazing" for glazing requirements to the extent not specified in this Section.
- 4. Division 10 Section "Exterior Sun Control Devices" for aluminum awnings at exterior aluminum windows not specified in this Section.

1.03 PERFORMANCE REQUIREMENTS

- A General: Provide aluminum-framed systems, including anchorage, capable of withstanding, without failure, the effects of the following:

- 1. Structural loads.
- 2. Thermal movements.
- 3. Movements of supporting structure indicated on Drawings including, but not limited to, story drift and deflection from uniformly distributed and concentrated live loads.
- 4. Dimensional tolerances of building frame and other adjacent construction.
- 5. Failure includes the following:
 - a) Deflection exceeding specified limits.

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- b) Thermal stresses transferred to building structure.
- c) Framing members transferring stresses, including those caused by thermal and structural movements, to glazing.
- d) Noise or vibration created by wind and thermal and structural movements.
- e) Loosening or weakening of fasteners, attachments, and other components.
- f) Sealant failure.
- g) Failure of operating units to function properly.

1.04 SUBMITTALS

- A Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of product indicated.
- B Shop Drawings: For aluminum-framed systems. Include plans, elevations, sections, details, and attachments to other Work.
 - 1. Include details of provisions for system expansion and contraction and for draining moisture occurring within the system to the exterior.
 - 2. For entrances, include hardware schedule and indicate operating hardware types, functions, quantities, and locations.
- C Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for aluminum-framed systems.
- D Maintenance Data: For aluminum-framed systems to include in maintenance manuals.

1.05 QUALITY ASSURANCE

- A Installer Qualifications: Capable of assuming engineering responsibility and performing Work of this Section and who is acceptable to manufacturer.
 - 1. Engineering Responsibility: Preparation of data for aluminum-framed systems including Shop Drawings based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project and submission of reports of tests performed on manufacturer's standard assemblies.
- B Product Options: Information on Drawings and in Specifications establishes requirements for systems' aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.

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1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

C Accessible Entrances: Comply with the "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."

1.06 PROJECT CONDITIONS

A Field Measurements: Verify actual locations of structural supports for aluminum-framed systems by field measurements before fabrication and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.01 MANUFACTURERS: Subject to compliance with requirements, provide products by the following:

1. Kawneer.
2. United States Aluminum.
3. Vistawall Architectural Products.
4. Or approved equal

2.02 MATERIALS

A Basis of Design: Kawneer, "Trifab 601", 2"x6", center glass plane.

B Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

2.03 FRAMING SYSTEMS

A Framing Members: Manufacturer's standard extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads.

B Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

C Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

1. Where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
2. Reinforce members as required to receive fastener threads.

D Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials. Form exposed

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flashing from sheet aluminum finished to match framing and of sufficient thickness to maintain a flat appearance without visible deflection.

- E Framing System Gaskets and Sealants: Manufacturer's standard recommended by manufacturer for joint type.

2.04 GLAZING SYSTEMS

- A Glazing: As specified in Division 8 Section "Glazing."
- B Glazing Gaskets: Manufacturer's standard compression types, replaceable, molded or extruded, that maintain uniform pressure and watertight seal.
- C Spacers and Setting Blocks: Manufacturer's standard elastomeric types.

2.05 DOORS

- A Doors: Manufacturer's standard glazed doors, for manual swing operation.
 - 1. Door Construction: 1-3/4-inch (44.5-mm) overall thickness, with minimum 0.125-inch- (3.2-mm-) thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deep penetration and fillet welded or that incorporate concealed tie rods.
 - 2. Door Design: Wide stile; 5-inch (127-mm) nominal width.
 - a) Accessible Doors: Smooth surfaced for width of door in area within 10 inches (255 mm) above floor or ground plane.
 - 3. Glazing Stops and Gaskets: Beveled or Square, snap-on, extruded-aluminum stops and preformed gaskets.
- B Door Hardware: As specified in Division 8 Section "Door Hardware."

2.06 ACCESSORY MATERIALS

- A Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Division 7 Section "Joint Sealants."
- B Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil (0.762-mm) thickness per coat.

2.07 FABRICATION

- A Form aluminum shapes before finishing.
- B Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations.
 - 2. Accurately fitted joints with ends coped or mitered.
 - 3. Means to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
 - 4. Physical and thermal isolation of glazing from framing members.

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5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 6. Provisions for field replacement of glazing from exterior.
 7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- C Mechanically Glazed Framing Members: Fabricate for flush glazing (without projecting stops).
- D Door Frames: Reinforce as required to support loads imposed by door operation and for installing hardware.
1. At exterior doors, provide compression weather stripping at fixed stops.
- E Doors: Reinforce doors as required for installing hardware.
1. At pairs of exterior doors, provide sliding weather stripping retained in adjustable strip mortised into door edge.
 2. At exterior doors, provide weather sweeps applied to door bottoms.
- F Hardware Installation: Factory install hardware to the greatest extent possible. Cut, drill, and tap for factory-installed hardware before applying finishes.
- G After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.
- 2.08 ALUMINUM FINISHES
- A General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- C Finish: Class II, Color Anodic Finish: AA-M12C22A41, color – Clear Anodized

PART 3 - EXECUTION

3.01 EXAMINATION

- A Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of Work.
1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A General:
1. Comply with manufacturer's written instructions.
 2. Do not install damaged components.

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3. Fit joints to produce hairline joints free of burrs and distortion.
 4. Rigidly secure nonmovement joints.
 5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration.
 6. Seal joints watertight, unless otherwise indicated.
- B Metal Protection:**
1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape or installing nonconductive spacers as recommended by manufacturer for this purpose.
 2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- C** Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
- D** Set continuous sill members and flashing in full sealant bed as specified in Division 7 Section "Joint Sealants" and to produce weathertight installation.
- E** Install components plumb and true in alignment with established lines and grades, without warp or rack.
- F** Install glazing as specified in Division 8 Section "Glazing."
- G Entrances:** Install to produce smooth operation and tight fit at contact points.
1. Exterior Entrances: Install to produce tight fit at weather stripping and weathertight closure.
 2. Field-Installed Hardware: Install surface-mounted hardware according to hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.
- H** Install perimeter joint sealants as specified in Division 7 Section "Joint Sealants" and to produce weathertight installation.
- I Erection Tolerances:** Install aluminum-framed systems to comply with the following maximum tolerances:
1. Location and Plane: Limit variation from true location and plane to 1/8 inch in 12 feet (3 mm in 3.7 m); 1/4 inch (6 mm) over total length.
 2. Alignment:
 - a) Where surfaces abut in line, limit offset from true alignment to 1/16 inch (1.5 mm).
 - b) Where surfaces meet at corners, limit offset from true alignment to 1/32 inch (0.8 mm).

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3. Diagonal Measurements: Limit difference between diagonal measurements to 1/8 inch (3 mm).

3.03 FIELD QUALITY CONTROL

- A Testing Agency: City will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B Testing Services: Testing and inspecting of representative areas to determine compliance of installed systems with specified requirements shall take place as follows and in successive stages as indicated on Drawings. Do not proceed with installation of the next area until test results for previously completed areas show compliance with requirements.
 - 1. Water Spray Test: Before installation of interior finishes has begun, a minimum area of 75 feet (23 m) by 1 story of aluminum-framed systems designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.
- C Repair or remove Work where test results and inspections indicate that it does not comply with specified requirements.
- D Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional Work with specified requirements.

3.04 ADJUSTING

- A Entrances: Adjust operating hardware for smooth operation according to hardware manufacturers' written instructions.
 - 1. For doors accessible to people with disabilities, adjust closers to provide a 1.5-second closer sweep period for doors to move from a 70-degree open position to 3 inches (75 mm) from the latch measured to the leading door edge.

END OF SECTION 08 41 10

**SPECIAL PROVISIONS
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SECTION 08 71 00

FINISH HARDWARE

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section Includes: Finish hardware except as otherwise specified or specifically omitted herein.
- B. Specific Omissions: Hardware for the following is specified or indicated elsewhere.
 - 1. Windows
 - 2. Cabinets of all kinds, including open wall shelving and locks.
 - 3. Toilet accessories of all kinds including grab bars.

1.02 SUBSTITUTIONS AND SUBMITTALS:

- A. Requests for substitutions must be made in writing (10) ten calendar days prior to bid date to allow architect to issue an addendum. If proposing a substitute, submit that product data attached to one showing specified item and indicate savings to be made. No other substitutions will be allowed.
 - 1. Items listed with no substitute manufactures have been requested by City to match existing.
- B. SUBMITTALS: Submit six copies of schedule at within 30 days of Notice to Proceed. Organize schedule into "Hardware Sets" with an index of doors and heading, indicating complete designations of every item required for each door or opening. Include the following information:
 - 1. Type, style, function, size, quantity and finish of each hardware item.
 - 2. Name, part number and manufacturer of each item.
 - 3. Fastenings and other pertinent information.
 - 4. Location of hardware set cross referenced to indications on drawings both on floor plans and in door schedule.
 - 5. Explanation of all abbreviations, symbols, and codes contained in schedule.
 - 6. Mounting locations for hardware.
 - 7. Door and frame sizes and materials.

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8. Submit manufacture's technical data and installation instructions for the electronic hardware.
9. Catalog cuts.
- C. Templates: Where required, furnish hardware templates to each fabricator of doors, frames and other Work to be factory-prepared for the installation of hardware.

1.03 QUALITY ASSURANCE:

- A. Qualifications:
 1. Obtain each kind of hardware (latch and locksets, exit devices, hinges, and closers) from only one manufacturer, although several may be indicated as offering products complying with requirements.
 2. Hardware supplier shall be a direct factory contract supplier who has in his employment a certified architectural hardware consultant (AHC) who is available at all reasonable times during the course of the Work, and for project hardware consultation to the City, Architect, and Contractor.
- B. Schedule Designations: Except as otherwise indicated, the use of one manufacturer's numeric designation system in schedules does not imply that another manufacturer's products will not be acceptable, unless they are not equal in design, size, weight, finish function, or other quality of significance. See 1.02 A for substitutions.
- C. Exit Doors: Openable at all times from the inside without the use of a key or any special knowledge or effort.
- D. Fire-rated openings: Provide hardware for fire-rated openings in compliance with NFPA Standard No. 80. This requirement takes precedence over other requirements for such hardware. Provide only such hardware which has been tested and listed by UL for the type and size of door required, and complies with the requirements of the door and the door frame labels. Latching hardware, door closers, ball bearing hinges, and seals are required whether or not listed in the Hardware schedule.
 1. Where panic exit devices are required on fire-rated doors, provide supplementary marking on door UL label on exit device indicating "Fire Exit Hardware."

1.04 DELIVERY, STORAGE, AND HANDLING:

- A. Acceptance at the Site: Individually package each unit of finish hardware complete with proper fastening and appurtenances, clearly marked on the outside to indicate contents and specific locations in the Work.

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- B. Deliver packaged hardware items at the times and to the locations (shop or field) for installation, as directed by the Contractor.

1.05 PROJECT CONDITIONS:

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

1.06 WARRANTY:

- A. Warranty: Provide manufacturer's written warranty in which manufacturer agrees to repair or replace hardware and its components that fail in materials or workmanship within specified warranty period indicated below. Manufacturer may not disclaim any implied warranty such as merchantability or fitness for a particular purpose. Both the expressed and implied terms of the warranty shall be read together for the benefit of the City
 - 1. Closers: Thirty years: except electronic closers: Twenty-five years.
 - 2. Exit Devices & Locksets: Ten years
 - 3. All other Hardware: Two years.
- B. Warranty period starts from Project Acceptance by City.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. See Drawings for Approved manufacturers.
- B. Furnish all items of hardware required to complete the work in accordance with specifications and plans.
- C. Carefully inspect Project for the extent of the finish hardware required to complete the Work. Where there is a conflict between these Specification and the existing hardware furnish finish hardware to specification.

2.02 MATERIALS:

- A. Exterior: Mortise type Locks and Latches shall be heavy-duty with hinged, anti-friction, 3/4 inch throw latchbolt with anti-friction piece made of self lubricating stainless steel. Functions and design as indicated on the hardware groups. Deadbolt functions shall be 1 inch projection made of hardened stainless steel. Both deadbolt and latchbolt are to extend into

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the case a minimum of 3/8 inch when fully extended. Furnish locksets and latchsets with sufficient curved strike lip to protect door trim. Provide locksets with 7-pin interchangeable core cylinders. All mortise cylinders shall have a concealed internal set screw for securing the cylinder to the lockset. The internal set screw will be accessible only by removing the core from the cylinder body. Locksets and latchsets to have self-aligning, thru-bolted trim. Auxiliary deadlatch to be made of one piece stainless steel, permanently lubricated. Lever handles must be of forged or cast brass, bronze or stainless steel construction. Levers which contain a hollow cavity are not acceptable. Spindle to be such that if forced it will twist first, then break, thus preventing forced entry. Levers to be operated with a roller bearing spindle hub mechanism.

Interior: All locksets and latchsets shall be extra-heavy-duty lever cylindrical with Schlage 7-pin interchangeable core. Lockset and Cores to be of the same manufacturer to maintain complete lockset warranty. Locks to have solid shank with no opening for access to keyed lever keeper. Keyed Lever to be protected by means of a break-away mechanism to prevent forced entry, when excessive torque is applied, a replaceable part will shear. Lock chassis must be through-bolted (outside of the lock chassis prep) to prevent rotation of chassis after installation. Strikes shall be 16 gauge curved brass, bronze or stainless steel with a 1" deep box construction, and have sufficient length to clear trim and protect clothing.

1. Grade 1 Cylindrical Locks shall have minimum 9/16 throw. All deadbolts shall have 1-inch minimum throw.
 2. Comply with requirements of local security ordinances.
 3. Lock Series and Design: Refer to Drawings, Door Hardware Schedule
- B. Hinges: Outswinging exterior doors shall have non removable pin hinges. All hinge open widths shall be minimum, but of sufficient size to permit door to swing 180. Furnish hinges with five knuckles and flush bearing.
1. Furnish 3 hinges per leaf to 7 foot 6 inch height. Add one for each additional 30 inches in height or fraction thereof.
 2. Provide hinges as listed in schedule.
- C. Exit Devices: Furnish all sets at wood doors with sex bolts unless otherwise specified. Lever handle trim shall match locksets. All touch bar type devices shall have deadlocking latchbolt, stainless steel touchpads or vinyl covered pads and be non-handed. The unlatching force shall not exceed 15 pounds when applied in the direction of exit travel.
- D. Surface Door Closers: Full rack and pinion type with removable non-ferrous cover. Provide sex bolts at all wood doors. Place closers inside

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MCKINLEY PARK RENOVATION

building, stairs, and rooms. Closers shall be non-handed, non-sized and adjustable.

1. Provide multi-size 1 through 6 at all doors rated or not.
 2. Flush transom offset brackets shall be used where parallel arm closers are listed for doors with fixed panels over.
 3. Drop brackets are required at narrow head rails.
 4. Set exterior doors closers to have 5 lbs maximum pressure to open, interior non-rated at 5 lbs, rated openings at 15 lbs.
- E. Kickplates: Provide with four beveled edges, 10 inches high by width less 2 inches on single doors and 1 inch on pairs of doors. Furnish countersunk screws to match finish.
- F. Seals: All seals shall be finished to match adjacent frame color. Material shall be UL listed for labeled openings.
- G. Screws: All exposed screws shall be Phillips head.
- H. Silencers: Furnish silencers on all interior frames, 3 for single doors, 2 for pairs. Omit where any type of seals occur.

2.03 FINISH:

- A. BHMA 626 Satin Chrome, unless otherwise noted.
1. Protection Plates, Push, Pulls shall be BHMA 630.
- B. Spray door closers to match other hardware, unless otherwise noted.
- C. Aluminum items shall be finished to match predominant adjacent material. Seals to coordinate with frame color.

2.04 KEYING REQUIREMENTS:

- A. Provide construction cores and keys during the construction period. Construction control and operating keys and core shall not be part of the City's permanent keying system or furnished on the same keyway (or key section) as the City's permanent keying system. Permanent cores and keys (prepared according to the accepted keying schedule) will be furnished to the City (by the local Schlage factory representative) prior to occupancy.
- B. All cylinders shall be Schlege FSIC 7-pin, Pack change keys independently (PKI)
- C. Permanent keys and cores shall be stamped with the applicable key mark for identification. These visual key control marks or codes will not include the actual key cuts. Permanent keys will also be stamped "Do Not Duplicate."

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- D. Locksets and cylinders will be keyed, master keyed, and grand master keyed into the City's system. Keying will be performed by City.
- E. The City, or the City's agent, will install permanent cores and return the construction cores to the Schlage Representative. All Construction cores and keys remain the property of Schlage.
- F. Keying schedule: Submit three copies of separate detailed schedule indicating clearly how the City's final instructions on keying of locks has been fulfilled.

PART 3 - EXECUTION

3.01 HARDWARE LOCATIONS:

- A. Hinges:
 - 1. Bottom Hinge: 10 inches from door bottom to bottom of hinge.
 - 2. Top Hinge: 5 inches from door top to top of hinge.
 - 3. Center Hinge: Center between top and bottom hinge.
 - 4. Extra Hinge: 6 inches from bottom of top hinge to top of extra hinge.
- B. Lock: 38 inches from finished floor to center of lever or knob.
- C. Push Bar: 44 inches from bottom of door to center of bar.
- D. Push Plate: 44 inches from bottom of door to center of plate.
- E. Pull Plate: 42 inches from bottom of door to center of pull.
- F. Exit Device: 39-13/16 inches from finished floor to center of pad.
- G. Deadlock Strike: 44 inches from floor, centered.

3.02 INSTALLATION:

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

3.03 ADJUSTING:

- A. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly.
- B. Inspection: Hardware supplier shall inspect all hardware furnished within (10) ten calendar days of Contractor's request and include with his guarantee a statement that this has been accomplished. Inspector or

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Contractor shall sign off the hardware as being complete and correctly installed and adjusted. Further corrections of defective material shall be the responsibility of the Contractor.

3.04 SCHEDULE OF FINISH HARDWARE:

- A. Schedule of Finish Hardware on the Drawings indicates which Hardware Set is used with each door.

END OF SECTION 08 71 00

**SPECIAL PROVISIONS
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SECTION 08 80 00

GLAZING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
 - 1. Windows and sidelites.
 - 2. Doors.
 - 3. Glazed entrances.
 - 4. Storefront framing.
 - 5. Curtain wall
- B. Related Sections include the following:
 - 1. Division 8 Section "Aluminum-Framed Entrances and Storefronts."

1.03 DEFINITIONS

1.04 PERFORMANCE REQUIREMENTS

- A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base

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engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.05 SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Samples: For the following products, in the form of 12-inch- (300-mm-) square Samples for glass.
 1. Each color of tinted float glass.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose Work has resulted in glass installations with a record of successful in-service performance; and who employs glass installers for this Project who are certified under the National Glass Association Glazier Certification Program as Level 2 (Senior Glaziers) or Level 3 (Master Glaziers).
- B. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for Project and whose Work has resulted in construction with a record of successful in-service performance.
- C. Safety Glass: Category II materials complying with testing requirements in 16 CFR 1201 and ANSI Z97.1.
 1. Subject to compliance with requirements, permanently mark safety glass with certification label of Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction.
- D. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 1. GANA Publications: GANA'S "Glazing Manual" and "Laminated Glass Design Guide."
 2. SIGMA Publications: SIGMA TM-3000, "Vertical Glazing Guidelines," and SIGMA TB-3001, "Sloped Glazing Guidelines."

SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION

- E. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the following inspecting and testing agency:
 - 1. Insulating Glass Certification Council.
 - 2. Associated Laboratories, Inc.
 - 3. National Accreditation and Management Institute.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. For insulating-glass units that will be exposed to substantial altitude changes, comply with insulating-glass manufacturer's written recommendations for venting and sealing to avoid hermetic seal ruptures.

1.08 PROJECT CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1.09 WARRANTY

- A. General Warranty: Special warranties specified in this Article shall not deprive City of other rights City may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Manufacturer's Special Warranty on Coated-Glass Products: Written warranty, made out to City and signed by coated-glass manufacturer agreeing to furnish replacements for those coated-glass units that deteriorate within specified warranty period indicated below.
 - 1. Warranty Period: 10 years from date of Project Acceptance.
- C. Manufacturer's Special Warranty on Insulating Glass: Written warranty, made out to City and signed by insulating-glass manufacturer agreeing to furnish replacements for insulating-glass units that deteriorate within specified warranty period indicated below.

SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION

1. Warranty Period: 10 years from date of Project Acceptance.

PART 2 - PRODUCTS

2.01 PRODUCTS AND MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the products indicated in schedules at the end of Part 3.

2.02 INSULATING GLASS

- A. Insulating-Glass Units: Preassembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E 774 for Class CBA units and with requirements specified in this Article and in the Insulating-Glass Schedule at the end of Part 3.

1. Provide Kind HS (heat-strengthened) float glass in place of annealed glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in "Performance Requirements" Article. Provide Kind FT (fully tempered) where safety glass is indicated.

- B. Overall Unit Thickness and Thickness of Each Lite: Dimensions indicated in the Insulating-Glass Schedule at the end of Part 3 are nominal and the overall thicknesses of units are measured perpendicularly from outer surfaces of glass lites at unit's edge.

- C. Sealing System: Dual seal, with primary and secondary sealants as follows:

1. Manufacturer's standard sealants.

- D. Spacer Specifications: Manufacturer's standard spacer material and construction.

- E. Spacer Specifications: Manufacturer's standard spacer material and construction complying with the following requirements:

1. Aluminum with mill or clear-anodized finish.
2. Corner Construction: Manufacturer's standard corner construction.

2.03 GLAZING GASKETS

SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION

- A. Dense Compression Gaskets: Molded or extruded gaskets of material indicated below, complying with standards referenced with name of elastomer indicated below, and of profile and hardness required to maintain watertight seal:
1. Neoprene, ASTM C 864.
 2. EPDM, ASTM C 864.
 3. Silicone, ASTM C 1115.
 4. Thermoplastic polyolefin rubber, ASTM C 1115.
 5. Any material indicated above.
- B. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned gaskets of material indicated below; complying with ASTM C 509, Type II, black; and of profile and hardness required to maintain watertight seal:
1. Neoprene.
 2. EPDM.
 3. Silicone.
 4. Thermoplastic polyolefin rubber.
 5. Any material indicated above.

2.04 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION

2.05 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

- A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing standard, to comply with system performance requirements.
- B. Grind smooth and polish exposed glass edges.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine framing glazing, with Installer present, for compliance with the following:
 - 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 - 2. Presence and functioning of weep system.
 - 3. Minimum required face or edge clearances.
 - 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

3.03 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Glazing channel dimensions, as indicated on Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.

SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION

- C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
- E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide spacers for glass lites where the length plus width is larger than 50 inches (1270 mm) as follows:
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
 - 2. Provide 1/8-inch (3-mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION

3.04 GASKET GLAZING (DRY)

- A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and Work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Install gaskets so they protrude past face of glazing stops.

3.05 PROTECTION AND CLEANING

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkaline deposits, or stains; remove as recommended by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents, and vandalism, during construction period.
- E. Wash glass on both exposed surfaces in each area of Project not more than four calendar days before date scheduled for inspections that establish date of Project Acceptance. Wash glass as recommended by glass manufacturer.

3.06 MONOLITHIC FLOAT-GLASS SCHEDULE

SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION

- A. Uncoated Clear Float Glass: Where glass as designated below is indicated, provide Type I (transparent glass, flat), Class 1 (clear) glass lites complying with the following:
1. Uncoated Clear Fully Tempered Float Glass: Kind FT (fully tempered).
- B. Coated Tinted Float Glass: Where glass as designated below is indicated, provide Class 2 (tinted, heat-absorbing, and light-reducing) glass lites complying with the following:
1. Tint Color: "Solexia" by PPG, or approved equal
 2. Coated Tinted Fully Tempered Float Glass: Kind FT (fully tempered).
- C. Low-E Coated Float Glass: Where glass as designated below is indicated, provide Class 2 (heat-absorbing, and light-reducing) glass lites complying with the following:
1. Low-E coated Fully Tempered Float Glass: Kind FT (fully tempered).

END OF SECTION 08 80 00

SECTION 09 29 00

GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Interior gypsum wallboard.
 - 2. Tile backing panels.

1.03 DEFINITIONS

- A. Gypsum Board Terminology: Refer to ASTM C 11 for definitions of terms for gypsum board assemblies not defined in this Section or in other referenced standards.

1.04 SUBMITTALS

- A. Product Data: For each type of product indicated.

1.05 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: For gypsum board assemblies with fire-resistance ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Fire-Resistance-Rated Assemblies: Indicated by design designations from GA-600, "Fire Resistance Design Manual."

SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION

- B. Gypsum Board Finish Mockups: Before finishing gypsum board assemblies, install mockups of at least 100 sq. ft. (9 sq. m) in surface area to demonstrate aesthetic effects and qualities of materials and execution.
 - 1. Install mockups for the following applications:
 - a) Surfaces indicated to receive textured paint finishes.
 - 2. Simulate finished lighting conditions for review of mockups.
 - 3. Approved mockups may become part of the completed Work if undisturbed at time of Project Acceptance.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Stack gypsum panels flat to prevent sagging.

1.07 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

PART 2 - PRODUCTS

2.01 INTERIOR GYPSUM WALLBOARD

- A. Panel Size: Provide in maximum lengths and widths available that will minimize joints in each area and correspond with support system indicated.
- B. Gypsum Wallboard: ASTM C 36.
 - 1. Type X (where indicated):
 - a) Thickness: 5/8 inch (15.9 mm).
 - b) Long Edges: Tapered.
 - c) Location: As indicated on drawings.

SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION

2.02 RESTROOMS, JANITORIAL, STORAGE AREAS

- A. Panel Size: Provide in maximum lengths and widths available that will minimize joints in each area and correspond with support system indicated.
- B. Water-Resistant Gypsum Backing Board: ASTM C 630/C 630M.
 - 1. Core: 5/8 inch (15.9 mm), regular type.
- C. Cementitious backer board for tile locations, Denshield or approved equal. "Greenboard" is not acceptable at tile installations.

2.03 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
 - 1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet].
 - 2. Shapes:
 - a) Cornerbead: Use at outside corners.
 - b) L-Bead: L-shaped; exposed long leg receives joint compound; use where indicated.

2.04 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475.
- B. Joint Tape:
 - 1. Interior Gypsum Wallboard: Paper.
 - 2. Tile Backing Panels: As recommended by panel manufacturer.
- C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
 - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
 - a) Use setting-type compound for installing paper-faced metal trim accessories.

SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION

3. Fill Coat: For second coat, use setting-type, sandable topping compound.
4. Finish Coat: For third coat, use setting-type, sandable topping compound.

D. Joint Compound for Tile Backing Panels:

1. Water-Resistant Gypsum Backing Board: Use setting-type taping and setting-type, sandable topping compounds.

2.05 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Contractor shall float, patch, repair, or skim existing wall surfaces as required, in order to achieve an acceptable wall substrate for the application of a new wall finish.

3.02 APPLYING AND FINISHING PANELS, GENERAL

- A. Gypsum Board Application and Finishing Standards: ASTM C 840 and GA-216.
- B. Install ceiling board panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION

- C. Install gypsum panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Attach gypsum panels to steel studs so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- F. Attach gypsum panels to framing provided at openings and cutouts.
- G. Form control and expansion joints with space between edges of adjoining gypsum panels.
- H. Cover both faces of steel stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect open concrete coffers, concrete joists, and other structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by coffers, joists, and other structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.
- I. Isolate perimeter of non-load-bearing gypsum board partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations, and trim edges with U-bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- J. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's written recommendations.
 - 1. Space screws a maximum of 12 inches (304.8 mm) o.c. for vertical applications.

SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION

- K. Space fasteners in panels that are tile substrates a maximum of 8 inches (203.2 mm) o.c.

3.03 PANEL APPLICATION METHODS

A. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.
2. On partitions/walls, apply gypsum panels vertically (parallel to framing) or horizontally (perpendicular to framing), unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a) Stagger abutting end joints not less than one framing member in alternate courses of board.
 - b) At stairwells and other high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assembly.

- B. Single-Layer Fastening Methods:** Apply gypsum panels to supports with steel drill screws.

C. Tile Backing Panels:

1. **Water-Resistant Gypsum Backing Board:** Install at showers, toilet, and locker rooms, and where indicated. Install with 1/4-inch (6.4-mm) gap where panels abut other construction or penetrations.
2. **Areas Not Subject to Wetting:** Install standard gypsum wallboard panels to produce a flat surface except at showers, tubs, and other locations indicated to receive water-resistant panels.
3. Where tile backing panels abut other types of panels in the same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.04 INSTALLING TRIM ACCESSORIES

- A. General:** For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

- B. Control Joints:** Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.

3.05 FINISHING GYPSUM BOARD ASSEMBLIES

SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
- D. Contractor shall install a new “orange peel” wall finish texture over the existing wall texture at all existing wall locations.
- E. Contractor shall float, patch, repair, or skim existing wall surfaces as required, in order to achieve an acceptable wall substrate for the application of a new wall finish.
- F. Gypsum Board Finish Levels: Finish panels to levels indicated below, according to ASTM C 840, for locations indicated:
 - 1. Level 1: Embed tape at joints in ceiling plenum areas, concealed areas, and where indicated, unless a higher level of finish is required for fire-resistance-rated assemblies and sound-rated assemblies.
 - 2. Level 4: Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges at panel surfaces that will be exposed to view, unless otherwise indicated.

END OF SECTION 09 29 00

**SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION**

SECTION 09 30 00

CERAMIC TILE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Glazed porcelain floor tile.
 - 2. Glazed wall tile.
 - 3. Metal edge strips installed as part of tile installations.

1.03 PERFORMANCE REQUIREMENTS

- A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:
 - 1. Level Surfaces: Minimum 0.6 wet.

1.04 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Verification:
 - 1. Full-size units of each type and composition of tile and for each color and finish required.
 - 2. Full-size units of each type of trim and accessory.
 - 3. Metal edge strips in 6-inch (150-mm) lengths.

1.05 QUALITY ASSURANCE

SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION

- A. Source Limitations for Tile: Obtain all from one source or producer.
 - 1. Obtain tile from same production run and of consistent quality in appearance and physical properties for each contiguous area.

- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from a single manufacturer and each aggregate from one source or producer.

- C. Source Limitations for Other Products: Obtain each of the following products specified in this Section through one source from a single manufacturer for each product:
 - 1. Joint sealants.
 - 2. Metal edge strips.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement in ANSI A137.1 for labeling sealed tile packages.

- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.

- C. Store liquid latexes and emulsion adhesives in unopened containers and protected from freezing.

1.07 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

1.08 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION

1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed, for each type, composition, color, pattern, and size indicated.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:
 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.
 2. Basis-of-Design Product: The design for each tile type is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified.

2.02 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.
 1. Provide tile complying with Standard grade requirements, unless otherwise indicated.
 2. For facial dimensions of tile, comply with requirements relating to tile sizes specified in Part 1 "Definitions" Article.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI standards referenced in "Setting and Grouting Materials" Article.
- C. Factory Blending: For tile exhibiting color variations within ranges selected during Sample submittals, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.

2.03 TILE PRODUCTS

- A. Manufacturers: Dal-Tile International Corp. or as indicated on finish plan, or approved equal.

SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION

- B. Unglazed Ceramic Floor Tile (restrooms): As indicated on Drawings
- C. Glazed Wall Tile: “As indicated on Drawings.
- D. Glazed Ceramic Floor Tile: As indicated on Drawings
- E. Glazed Wall Tile Trim Units: Matching characteristics of adjoining flat tile and coordinated with sizes and coursing of adjoining flat tile where applicable. Provide shapes as follows, selected from manufacturer's standard shapes:
 - 1. Base for Thin-Set Mortar Installations: Restroom locations shall have a coved base.
 - 2. Wainscot Cap for Thin-Set Mortar Installations: Surface bullnose, module size to match wall tile.
 - 3. Wainscot Cap for Flush Conditions: Regular flat tile for conditions where tile wainscot is shown flush with wall surface above.
 - 4. External Corners for Thin-Set Mortar Installations: Surface bullnose.
 - 5. Internal Corners: Field-buttet square corners except with coved base and cap angle pieces designed to fit with stretcher shapes.

2.04 SETTING AND GROUTING MATERIALS

- A. Available Manufacturers:
 - 1. Custom Building Products.
 - 2. DAP, Inc.
 - 3. LATICRETE International Inc.
 - 4. MAPEI Corporation.
 - 5. Or approved equal.
- B. Organic Adhesive: ANSI A136.1, Type I.
- C. Standard Sanded Epoxy Cement Grout:, color as selected by Architect.

2.05 ELASTOMERIC SEALANTS

- A. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints, unless otherwise indicated.

SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION

- B. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.
1. Available Products:
 - a) Dow Corning Corporation; Dow Corning 786.
 - b) GE Silicones; Sanitary 1700.
 - c) Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.
 - d) Tremco, Inc.; Tremsil 600 White.
 - e) Or approved equal.

2.06 MISCELLANEOUS MATERIALS

- A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
- B. Metal Edge Strips: Angle or L-shape, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications, stainless steel; ASTM A 666, 300 Series exposed-edge material.
- C. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
- D. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints that does not change color or appearance of grout.
1. Available Products:
 - a) Bonsal, W. R., Company; Grout Sealer.
 - b) Bostik; CeramaSeal Grout Sealer.
 - c) Custom Building Products; Surfaceguard Grout Sealer.
 - d) MAPEI Corporation; KER 003, Silicone Spray Sealer for Cementitious Tile Grout.
 - e) Summitville Tiles, Inc.; SL-15, Invisible Seal Penetrating Grout and Tile Sealer.
 - f) Or approved equal.

SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION

2.07 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
 - 1. Verify that substrates for setting tile are firm; dry; clean; free of oil, waxy films, and curing compounds; and within flatness tolerances required by referenced ANSI A108 Series of tile installation standards for installations indicated.
 - 2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.
 - 3. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.
- B. Blending: For tile exhibiting color variations within ranges selected during Sample submittals, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken

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from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

- C. Contractor shall grind, patch, float the floor substrate as required to create a level flooring surface.

3.03 INSTALLATION, GENERAL

- A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.
- B. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation." Comply with TCA installation methods indicated in ceramic tile installation schedules.
- C. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- E. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.
 - 1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
- F. Lay out tile wainscots to next full tile beyond dimensions indicated.
- G. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated during

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installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

1. Locate joints in tile surfaces directly above joints in concrete substrates.
2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."

H. Grout tile to comply with requirements of the following tile installation standards:

1. For ceramic tile grouts (sand-portland cement; dry-set, commercial portland cement; and latex-portland cement grouts), comply with ANSI A108.10.

3.04 FLOOR TILE INSTALLATION

- A. General: Install tile to comply with requirements in the Floor Tile Installation Schedule, including those referencing TCA installation methods and ANSI A108 Series of tile installation standards.
- B. Joint Widths: Pursuant to manufacturer's recommendation.
- C. Metal Edge Strips: Install at locations indicated or where exposed edge of tile flooring meets carpet or other flooring that finishes flush with top of tile.
- D. Grout Sealer: Apply grout sealer to grout joints according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer that has gotten on tile faces by wiping with soft cloth.

3.05 WALL TILE INSTALLATION

- A. Install types of tile designated for wall installations to comply with requirements in the Wall Tile Installation Schedule, including those referencing TCA installation methods and ANSI setting-bed standards.
- B. Joint Widths: Install tile on walls with 1/16 inch joint widths:

3.06 CLEANING AND PROTECTING

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

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1. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions, but no sooner than (10) ten calendar days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
 2. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent it from clogging drains.
- B. When recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.
- C. Prohibit foot and wheel traffic from tiled floors for at least (7) seven calendar days after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

3.07 FLOOR TILE INSTALLATION SCHEDULE

- A. Tile Installation: Interior floor installation on over concrete slab, thinset mortar epoxy grout; TCA F115 and ANSI A108.5.
1. Tile Type: Glazed porcelain floor tile.
 2. Grout: Standard sanded cement grout.

3.08 WALL TILE INSTALLATION SCHEDULE

- A. Tile Installation: Interior wall installation over cementitious backer board, DensShield, or approved equal, on metal studs; organic adhesive; TCA W242 and ANSI A108.4.
1. Tile Type: Glazed wall tile.
 2. Grout: Standard non-sanded cement grout.

END OF SECTION 09 30 00

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SECTION 09 65 13

RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Retain or delete this article in all Sections of Project Manual.
- B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:Thermoset-rubber base.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Retain "Samples" Paragraph below for single-stage Samples, with a subordinate list if applicable. Retain "Samples for Initial Selection" and "Samples for Verification" paragraphs for two-stage Samples.
- C. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples, but not less than 12 inches long.
- D. Product Schedule: indicated on Drawings

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
- B. Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.5 DELIVERY, STORAGE, AND HANDLING: Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.6 FIELD CONDITIONS

- A. Ambient temperature range for installation varies among manufacturers. Consult manufacturers for recommendations and revise first paragraph below to suit Project.

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- B. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than [95 deg F in spaces to receive resilient products during the following periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- C. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F
- D. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 THERMOSET-RUBBER BASE

- A. Manufactured by Johnsonite, Burke or approved equal
- B. Copy this article and re-edit for each product.
- C. Insert drawing designation. Use these designations on Drawings to identify each product.
- D. Product Standard: ASTM F 1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous).
- E. Style and Location:
 - 1. Cove: refer to drawings for locations
 - 2. Thickness: 0.125 inch
 - 3. Height: 6 inches
 - 4. Lengths: Coils in manufacturer's standard length
 - 5. Coordinate "Outside Corners" and "Inside Corners" paragraphs below with "Resilient Base Installation" Article.
 - 6. Outside Corners: Preformed
 - 7. Inside Corners: Preformed
 - 8. Retain "Colors" Paragraph below if colors are not indicated in a separate schedule.
 - 9. Colors: As Selected by Architect from manufacturer's full range

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2.2 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION: Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

- A. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION: Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products according to ASTM F 710.

- A. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
- B. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- C. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 10 pH.
- D. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft. 1000 sq. ft. and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
 - 1. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
 - 2. Relative Humidity Test: Using in-situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

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- E. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- F. Do not install resilient products until materials are the same temperature as space where they are to be installed.
- G. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.
- H. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, lockers, and other permanent fixtures in rooms and areas where base is required identified on schedule.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.

3.4 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Perform the following operations immediately after completing resilient-product installation:
 - 1. Remove adhesive and other blemishes from surfaces.
 - 2. Sweep and vacuum horizontal surfaces thoroughly.

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- 3. Damp-mop horizontal surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 09 65 13

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SECTION 09 91 00

PAINTING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes surface preparation and field painting of exposed exterior and interior items and surfaces.
 - 1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

- B. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from a full range of colors and finishes available.
 - 1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, suspended ceiling tiles and suspension grids, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish. Painting shall include exposed mechanical registers and grills.

- C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels, unless otherwise noted.
 - 1. Prefinished items include the following factory-finished components:
 - a) Acoustical wall panels, uon
 - b) Metal toilet enclosures.
 - c) Metal lockers.
 - d) Light fixtures (Not including trims).
 - e) Drinking Fountains.

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- f) Fire Extinguisher Cabinets
- 2. Concealed surfaces include walls or ceilings in the following generally inaccessible spaces:
 - a) Furred areas.
 - b) Ceiling plenums.
 - c) Pipe spaces.
 - d) Duct shafts.
- 3. Finished metal surfaces include the following:
 - a) Anodized aluminum, UON.
 - b) Stainless steel.
 - c) Chromium plate.
 - d) Copper and copper alloys.
 - e) Bronze and brass.
- 4. Operating parts include moving parts of operating equipment and the following:
 - a) Valve and damper operators.
 - b) Linkages.
 - c) Sensing devices.
 - d) Motor and fan shafts.
- 5. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

D. Related Sections include the following:

- 1. Division 5 Section "Structural Steel Framing" for shop priming structural steel.
- 2. Division 5 Section "Metal Fabrications" for shop priming ferrous metal.
- 3. Division 8 Section "Hollow Metal Doors and Frames" for factory priming steel doors and frames.
- 4. Division 9 Section "Gypsum Board Assemblies" for surface preparation of gypsum board.

1.03 DEFINITIONS

- A. General: Standard coating terms defined in ASTM D 16 apply to this Section.

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1. Semigloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter.
2. Full gloss refers to high-sheen finish with a gloss range more than 70 when measured at a 60-degree meter.

1.04 SUBMITTALS

- A. Product Data: For each paint system indicated. Include block fillers and primers.
 1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
 2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.
- B. Samples for Verification: For each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.
 1. Provide stepped Samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.
 2. Provide a list of materials and applications for each coat of each Sample. Label each Sample for location and application.
 3. Submit Four samples on the following substrates for Architect's review of color and texture only:
 - a) Concrete: 4-inch- (100-mm-) square samples for each color and finish.
 - b) Stained or Natural Wood: 4-by-8-inch (100-by-200-mm) Samples of natural- or stained-wood finish on representative surfaces.

1.05 QUALITY ASSURANCE

- A. Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

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- B. Source Limitations: Obtain for each coating system from the same manufacturer as the finish coats.

- C. Benchmark Samples (Mockups): Provide a full-coat benchmark finish sample for each type of coating and substrate required. Comply with procedures specified in Painting and Decorating Contractors of America (PDCA) P5. Duplicate finish of approved sample Submittals.
 - 1. Architect will select one room or surface to represent surfaces and conditions for application of each type of coating and substrate.
 - a) Wall Surfaces: Provide samples on at least 5 sq. ft..
 - b) Small Areas and Items: Architect will designate items or areas required.
 - 2. Apply benchmark samples, according to requirements for the completed Work, after permanent lighting and other environmental services have been activated. Provide required sheen, color, and texture on each surface.
 - a) After finishes are accepted, Architect will use the room or surface to evaluate coating systems of a similar nature.
 - 3. Final approval of colors will be from benchmark samples.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
 - 1. Product name or title of material.
 - 2. Product description (generic classification or binder type).
 - 3. Manufacturer's stock number and date of manufacture.
 - 4. Contents by volume, for pigment and vehicle constituents.
 - 5. Thinning instructions.
 - 6. Application instructions.
 - 7. Color name and number.
 - 8. VOC content.

- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain storage containers in a clean condition, free of foreign materials and residue.

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1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily.

1.07 PROJECT CONDITIONS

- A. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F (10 and 32 deg C).
- B. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 and 95 deg F (7 and 35 deg C).
- C. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.
 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Products: Subject to compliance with requirements.
 1. Benjamin Moore & Co. (Benjamin Moore).
 2. Dunn Edwards Paints
 3. Or Approved equal.

2.02 PAINT MATERIALS, GENERAL

- A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
 1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named

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are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.

- C. Colors: As selected by Architect from manufacturer's full range. Contractor shall assume for bidding purposes that a minimum of 6 interior colors and 6 exterior colors will be used at various locations and quantities throughout the Project.

2.03 EXTERIOR PRIMERS

- A. Exterior Concrete and Masonry Primer: Factory-formulated alkali-resistant acrylic-latex primer for exterior application.
 - 1. Benjamin Moore; Moore's Acrylic Masonry Sealer No. 066: Applied at a dry film thickness of not less than 0.7 mils (0.018 mm), or approved equal.
- B. Exterior Ferrous-Metal Primer: Factory-formulated rust-inhibitive metal primer for exterior application.
 - 1. Benjamin Moore; Moore's IMC Alkyd Metal Primer No. M06: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm), or approved equal.

2.04 INTERIOR PRIMERS

- A. Interior Gypsum Board Primer: Factory-formulated latex-based primer for interior application.
 - 1. Benjamin Moore; Moorcraft Super Spec Latex Enamel Undercoater & Primer Sealer No. 253: Applied at a dry film thickness of not less than 1.2 mils (0.030 mm), or approved equal.
- B. Interior Ferrous-Metal Primer: Factory-formulated quick-drying rust-inhibitive alkyd-based metal primer.
 - 1. Benjamin Moore; Moore's IMC Alkyd Metal Primer No. M06: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm), or approved equal.
- C. Concrete and Masonry Primer
 - 1. Benjamin Moore; Applied at a dry film thickness of not less than 2.0 mils (0.051 mm), or approved equal.

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2.05 EXTERIOR FINISH COATS

1. Exterior Semigloss Acrylic Enamel: Factory-formulated semigloss waterborne acrylic-latex enamel for exterior application.
2. Benjamin Moore; Moorcraft Super Spec Latex House & Trim Paint No. 170: Applied at a dry film thickness of not less than 1.1 mils (0.028 mm) , or approved equal.

2.06 INTERIOR FINISH COATS

- A. Interior Acrylic Enamel: Factory-formulated eggshell & satin acrylic-latex enamel for interior application.
 1. Benjamin Moore; Moorcraft Super Spec Latex Eggshell & Satin Enamel: Applied at a dry film thickness of not less than 1.2 mils (0.031 mm), or approved equal.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application.
 1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
 2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.
 3. Notify Architect about anticipated problems when using the materials specified over substrates primed by others.

3.02 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
 1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

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- B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.
1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
1. Provide barrier coats over incompatible primers or remove and reprime.
 2. Cementitious Materials: Prepare concrete, concrete unit masonry, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
 - a) Use abrasive blast-cleaning methods if recommended by paint manufacturer.
 - b) Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces if moisture content exceeds that permitted in manufacturer's written instructions.
 - c) Clean concrete floors to be painted with a 5 percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, rinse, allow to dry, and vacuum before painting.
 3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
 - a) Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
 - b) Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides of wood, including cabinets, counters, cases, and paneling.
 - c) If transparent finish is required, backprime with spar varnish.
 - d) Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on back side.

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- e) Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.
- 4. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's recommendations.
 - a) Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.
- D. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
 - 1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
 - 2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
 - 3. Use only thinners approved by paint manufacturer and only within recommended limits.
- E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.03 APPLICATION

- A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
 - 1. Paint colors, surface treatments, and finishes are indicated in the paint schedules.
 - 2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
 - 3. Provide finish coats that are compatible with primers used.
 - 4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.

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5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
 7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
 8. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
 9. Sand lightly between each succeeding enamel or varnish coat.
- B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
 2. Omit primer over metal surfaces that have been shop primed and touchup painted.
 3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
 4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.
- C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
 2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.

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3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.

- D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.

- E. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces.

- F. Mechanical items to be painted include, but are not limited to, the following:
 1. Tanks that do not have factory-applied final finishes.
 2. Visible portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets.
 3. Mechanical equipment that is indicated to have a factory-primed finish for field painting.

- G. Electrical items to be painted include, but are not limited to, the following:
 1. Panelboards.

- H. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

- I. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

- J. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling, such as laps, irregularity in texture, skid marks, or other surface imperfections.

- K. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.04 FIELD QUALITY CONTROL

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MCKINLEY PARK RENOVATION

- A. City reserves the right to invoke the following test procedure at any time and as often as City deems necessary during the period when paint is being applied:
 - 1. City will engage a qualified independent testing agency to sample paint material being used. Samples of material delivered to Project will be taken, identified, sealed, and certified in the presence of Contractor.
 - 2. Testing Agency shall perform appropriate tests as required.

3.05 CLEANING

- A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.
 - 1. After completing painting, clean paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.06 PROTECTION

- A. Protect Work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.
- B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their Work.
 - 1. After Work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.07 EXTERIOR PAINT SCHEDULE

- A. Concrete, Stucco, and Concrete Unit Masonry: Provide the following finish systems over exterior concrete, stucco, and brick masonry substrates:
 - 1. Acrylic-Enamel Finish: Two finish coats over a primer.
 - a) Primer: Exterior concrete and masonry primer.
 - b) Finish Coats: Exterior semigloss acrylic enamel.
 - 2. Clear concrete/masonry sealer at all interior non-painted CMU locations
 - 3. Provide graffiti coat sealer at all masonry exterior masonry locations
- B. Ferrous Metal: Provide the following finish systems over exterior ferrous metal. Primer is not required on shop-primed items.

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1. Semigloss Acrylic-Enamel Finish: Two finish coats over a rust-inhibitive primer.
 - a) Primer: Exterior ferrous-metal primer.
 - b) Finish Coats: Exterior semigloss acrylic enamel.

3.08 INTERIOR PAINT SCHEDULE

- A. Gypsum Board: Provide the following finish systems over interior gypsum board surfaces:
 1. Eggshell Acrylic-Enamel Finish: Two finish coats over a primer.
 - a) Primer: Interior gypsum board primer.
 - b) Finish Coats: Interior eggshell acrylic enamel.
 2. Flat Acrylic-Enamel Finish: Two finish coats over a primer.
 - a) Primer: Interior gypsum board primer.
 - b) Finish Coats: Interior Flat acrylic enamel.
- B. Ferrous Metal: Provide the following finish systems over ferrous metal:
 1. Semigloss Acrylic-Enamel Finish: Two finish coats over a primer.
 - a) Primer: Interior ferrous-metal primer.
 - b) Finish Coats: Interior semigloss acrylic enamel.

END OF SECTION 09 91 00

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MCKINLEY PARK RENOVATION**

SECTION 10 14 00

SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY: This Section includes exterior and interior signage.

1.3 DEFINITIONS

- A. ADA-ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines."

1.4 SUBMITTALS

- A. Shop Drawings: Show fabrication and installation details for signs.
 - 1. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
 - 2. Provide message list, typestyles, graphic elements, including tactile characters and Braille, and layout for each sign.
- B. Samples for Verification: For each of the following products and for the full range of color, texture, and sign material indicated, of sizes indicated:
 - 1. Panel Signs: Not less than 12 inches square.
 - 2. Accessories: Manufacturer's full-size unit.
- D. Maintenance Data: For signs to include in maintenance manuals.
- E. Warranty: Provide warranty in accordance with this specification section, in addition to the warranty and/or guarantee requirements stated elsewhere in Contract Documents including, but not limited to, Part III: Contract Documents Contract, Part IV: General Conditions, and Division 1 of technical specifications.

1.5 QUALITY ASSURANCE

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- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- C. Source Limitations for Signs: Obtain each sign type indicated from one source from a single manufacturer.
- E. Regulatory Requirements: Comply with applicable provisions in ADA-ABA Accessibility Guidelines.

1.5 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when weather conditions permit installation of signs in exterior locations to be performed according to manufacturers' written instructions and warranty requirements.
- B. Field Measurements: Verify recess openings by field measurements before fabrication and indicate measurements on Shop Drawings.

1.6 COORDINATION: Coordinate placement of anchorage devices with templates for installing signs.

1.7 WARRANTY

- A. Provide manufacturer's written warranty in which manufacturer agrees to repair or replace signage that fails in materials or workmanship within specified warranty period as indicated below. Manufacturer may not disclaim any implied warranty such as merchantability or fitness for a particular purpose. Both the expressed and implied terms of the warranty shall be read together for the benefit of the City.

1. Failures include, but are not limited to, the following:

- a) Deterioration of metal and polymer finishes beyond normal weathering.
- b) Deterioration of embedded graphic image colors and sign lamination.

2. Warranty Period: Five years from date of Project Acceptance.

PART 2 - PRODUCTS

2.1 SIGNS

- A. Exterior Signs: All building entrances that are accessible to and usable by persons with disabilities shall be identified with at least one standard sign

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(International accessibility symbol) with additional directions signs, as required, to be visible to persons along approaching pedestrian ways and paths-of-travel.

B. Interior Signs:

1. General: Each room shall be provided with Room Identification signage. All Signage shall comply with the 2016 California Building Code (CBC), Section 11B-703 Signs.
2. All doors within the building shall receive signage With California Braille identification (larger than typical ADA Braille). The Braille shall be grade 2 with 1/10th inch on centers within each cell with 2/10th inch between cells. Dots shall be raised 1/40th inch above background. Letters and numbers on signs shall have a width-to-height ratio of between 3:5 and 1:1 and a stroke width to height ratio between 1:5 and 1:10. Signs shall be mounted 60" A.F.F. and 4"-12" from strike side of doors. Each toilet room shall have required identification signs (on Door and on adjacent wall), which contain the international symbol of accessibility in white on a blue background, color number 15090 in Federal Standard 595B.

2.2 MATERIALS

- A. Aluminum Sheet and Plate: ASTM B 209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with at least the strength and durability properties of Alloy 5005-H32.
- C. Fiberglass Sheet: Molded, seamless, thermosetting, glass-fiber-reinforced polyester panels with a minimum tensile strength of 15,000 psi when tested according to ASTM D 638 and with a minimum flexural strength of 30,000 psi when tested according to ASTM D 790.
- D. Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), Type UVA (UV absorbing).
- E. Applied Vinyl: Die-cut characters from vinyl film of nominal thickness of 3 mils with pressure-sensitive adhesive backing, suitable for exterior applications.

2.3 PANEL SIGNS

- A. Delete this Article if no panel signs
- B. Exterior Panel Signs: Provide smooth sign panel surfaces constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch measured diagonally from corner to corner, complying with the following requirements:

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1. Aluminum Sheet: 0.125 inch thick.
 2. Fiberglass Sheet: 0.125-inch- thick sheet.
 3. Edge Condition: Bullnose.
 4. Corner Condition: Square.
 5. Mounting: As indicated.
 6. Color: As selected by Architect from manufacturer's full range.
- C. Tactile and Braille Sign: Manufacturer's standard process for producing text and symbols complying with ADA-ABA Accessibility Guidelines and with ICC/ANSI A117.1. Text shall be accompanied by Grade 2 Braille. Produce precisely formed characters with square-cut edges free from burrs and cut marks; Braille dots with domed or rounded shape.
1. Panel Material: Opaque acrylic sheet.
 2. Raised-Copy Thickness: Not less than 1/32 inch.
- D. Applied Vinyl: Die-cut characters from vinyl film of nominal thickness of 3 mils with pressure-sensitive adhesive backing.

2.4 ACCESSORIES

- A. Anchors and Inserts: Provide nonferrous-metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion-bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.

2.4 FABRICATION

- A. General: Provide manufacturer's standard signs of configurations indicated.
1. Welded Connections: Comply with AWS standards for recommended practices in shop welding. Provide welds behind finished surfaces without distortion or discoloration of exposed side. Clean exposed welded surfaces of welding flux and dress exposed and contact surfaces.
 2. Mill joints to tight, hairline fit. Form joints exposed to weather to exclude water penetration.
 3. Preassemble signs in the shop to greatest extent possible. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in location not exposed to view after final assembly.

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4. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.

2.5 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.6 ALUMINUM FINISHES

- E. Color Anodic Finish: Manufacturer's standard Class 1 integrally colored or electrolytically deposited color anodic coating, 0.018 mm or thicker, in black applied over a polished (buffed) mechanical finish, complying with AAMA 611.

2.7 ACRYLIC SHEET FINISHES

- A. Colored Coatings for Acrylic Sheet: For copy and background and frame colors, provide colored coatings, including inks, dyes, and paints, that are recommended by acrylic manufacturers for optimum adherence to acrylic surface and that are UV and water resistant for five years for application intended.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Verify that items, including anchor inserts, are sized and located to accommodate signs.

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- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- 3.2 INSTALLATION: Locate signs and accessories where indicated, using mounting methods of types described and complying with manufacturer's written instructions.
- A. Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance.
 - B. Revise subparagraph below to suit Project. Delete if all locations are scheduled or indicated on Drawings.
 - C. Interior Wall Signs: Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches of sign without encountering protruding objects or standing within swing of door.
 - D. Wall-Mounted Signs: Comply with sign manufacturer's written instructions except where more stringent requirements apply.
 - E. Two-Face Tape: Mount signs to smooth, nonporous surfaces. Do not use this method for vinyl-covered or rough surfaces.
- 3.3 CLEANING AND PROTECTION
- A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by City.

END OF SECTION 10 14 00

SECTION 10 21 13

TOILET COMPARTMENTS

PART 1 - GENERAL

- 1.01 Work Included
 - A. Toilet Compartments
 - B. Urinal Screens
 - C. Shower Dividers
 - D. Dressing Compartments
 - E. Benches

- 1.02 Related Sections
 - A. Support for ceiling-hung compartments.
 - B. Wall backing required to secure mounting brackets.
 - C. Support for floor-anchored compartments.
 - D. Toilet room accessories.

- 1.03 References (including but not limited to)
 - A. *National Fire Protection Association 101 Life Safety Code, 2006 Edition, Chapter 10*
 - B. *ANSI A117- 1986 Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.*
 - C. *International Building Code (IBC), 2006 Edition, Chapters 8, 11, and 12.*
 - D. *International Plumbing Code (IPC), 2006 Edition, Chapter 3, Section 10.*
 - E. *Title 24, California Code of Regulations, Parts 2, 3, and 5.*
 - F. *ADA, Accessibility Guidelines for Buildings and Facilities, Federal Register Volume 56, Number 144, Rules and Regulations.*
 - G. *Fair Housing Amendments Act of 1988, Accessibility Guidelines, Federal Register Volume 56, Number 44.*
 - H. *Southern Building Code.*

- 1.04 QUALITY ASSURANCE
 - A. Manufacturers
 - 1. Bobrick 1082.67P Solid Phenolic Toilet Partitions with institutional hardware. Model numbers for compartments manufactured by

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Bobrick Washroom Equipment, Inc., are listed to establish a standard of quality for design, function, materials, workmanship, and appearance. Other manufacturers may be submitted for evaluation by the architect by following the conditions of the substitutions clause. Unless approval is obtained ten days prior to the bid date, all bids shall be based on the standard of quality. The architect shall be the sole judge as to the acceptability of all products submitted for substitution.

2. Compartments shall be the product(s) of a single manufacturer.
3. Or equal approved by architect

1.05 Submittals

A. Comply with requirements of Section regarding submittals.

B. Manufacturer's Data

1. Provide required number copies of:
 - a. Product data sheets.
 - b. Installation instructions.
 - c. Replacement parts information.

C. Shop Drawings

1. Provide required number of copies of all shop drawings.
2. Show fabrication and erection of compartment assemblies, to extent not fully described by manufacturer's data sheets.
3. Show anchorage, accessory items and finishes.
4. Provide location drawings for bolt hole locations in supporting members for attachment of compartments.

D. Samples

1. Furnish scale model of compartments, including stile, shoe, door, door hardware, divider panel, and mounting brackets.
2. Furnish sections showing stile anchoring and leveling devices, concealed threaded inserts, panel and stile construction and edge construction.

1.06 Product Delivery, Storage, and Handling

A. Deliver items in manufacturer's original unopened protective packaging.

B. Store materials in original protective packaging to prevent physical damage or wetting.

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C. Handle so as to prevent damage to finished surfaces.

1.07 Warranty

- A. Furnish 25 year warranty for panels, doors, and stiles against breakage, corrosion, delamination, and defects in factory workmanship.
- B. Furnish one-year guarantee against defects in material and workmanship for stainless steel door hardware and mounting brackets.

PART 2 - PRODUCTS

2.01 Configurations

A. National Fire Protection Association and International Building Code Interior Wall and Ceiling finish Class B

1. Toilet Compartments shall be:

Overhead-Braced 1082G.67P Duraline Series, Finish as selected from Manufacture's full range.

2. Urinal Screens shall be:

Wall-Hung (1085.67 DuralineSeries, , Finish as selected from Manufacture's full range.

3. Shower Stalls 1082.67 Shower Curtain must be recessed into head Rail.

2.02 Components/Materials

A. Stiles, Panels, Doors, Screens, and Benches

1. Solid phenolic material constructed of solidly fused plastic laminate with matte-finish melamine surfaces, colored face sheets, and black phenolic-resin core that are integrally bonded. Edges shall be black. Brown edges shall not be acceptable. Color and pattern as selected by architect from Bobrick standard colors.

2. For 1080 DuralineSeries: solid phenolic material shall meet National Fire Protection Association and International Building Code Interior Wall and Ceiling Finish Class B, Uniform Building Code Class II, ASTM E-84 Fire Resistance Standards: flame spread 69, smoke density 93.

3. Finish Thickness

a. Stiles and doors shall be 3/4" (19mm).

b. Panels and benches shall be 1/2" (13mm).

B. Hardware

1. All hardware to be 18-8, type-304 stainless steel with satin finish.

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2. All hardware shall be concealed inside compartments with the exception of outswing doors, utilizing brass threaded inserts.
3. Hardware of chrome-plated "Zamak" and aluminum are unacceptable.

C. Vandal-Resistant Hardware (.67P)

1. Sliding door latch shall be 14-gauge (2mm) and shall slide on nylon track.
2. Sliding door latch shall require less than 5-lb force to operate. Twisting latch operation will not be acceptable.
3. Latch track shall be attached to door by flathead machine screws into factory-installed threaded brass inserts.
4. Latch handle shall have rubber bumper to act as door stop.
5. Latch shall allow door to be lifted over 8-gauge (4.4mm) keeper for emergency access.
6. Metal-to-metal connection shall withstand a direct pull of over 1,500 lb. per screw.

D. Hinges

1. Hinge shall be 14 gauge pin & barrel hinges
2. All doors shall be set to stay open, when patron leaves stall
3. Pin and barrel hinge shall be attached to door and stile by theft-resistant, one-way, stainless steel machine screws into threaded brass inserts.
4. Door shall be furnished with two 11-gauge (3mm) vinyl-coated door stops to resist door from being kicked out of compartment.
5. Door stops and keeper shall be secured with stainless steel, one-way, machine screws from inside of compartment to threaded brass inserts.

E. Clothes Hook shall be constructed of stainless steel and shall project no more than 1-1/8" (29mm) from face of door. Clothes hook shall be secured by theft-resistant, one-way stainless steel screws. Clothes hook shall be installed at all toilet compartments.

F. Mounting brackets shall be 18-gauge (1.2mm) stainless steel and extend full height of panel. U-channels shall be furnished for panel to stile mounting. Angle brackets shall be furnished for stile-to-wall and stile-to-panel mounting. Angle brackets shall be furnished for panel-to-wall mounting.

G. Leveling Device shall be 3/16" (5mm) hot rolled steel bar; chromate-treated and zinc-plated; through-bolted to base of solid phenolic stile.

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- H. Stile Shoe shall be one-piece, 4" (102mm) high, type-304, 22-gauge (0.8mm) stainless steel with satin-finish. Top shall have 90° return to stile. Patented one-piece shoe capable of adapting to 3/4" or 1" stile thickness and capable of being fastened (by clip) to stiles starting at wall line.
- I. Headrail (Overhead-Braced) shall be satin finish, extruded anodized aluminum (.065" / 1.65mm thick) with anti-grip profile.

PART 3 - EXECUTION

3.01 Inspection

- A. Check areas scheduled to receive compartments for correct dimensions, plumbness of walls, and soundness of surfaces that would affect installation of mounting brackets.
- B. Verify spacing of plumbing fixtures to assure compatibility with installation of compartments.
- C. Do not begin installation of compartments until conditions are satisfactory.

3.02 Erection

- A. Install compartments rigidly, straight, plumb, and level and in accordance with manufacturer's installation instructions.
- B. Installation methods shall conform to manufacturer's recommendations for backing and proper support.
- C. Conceal evidence of drilling, cutting, and fitting to room finish.
- D. Maintain uniform clearance at vertical edge of doors.

3.03 Adjustment and Cleaning

- A. Adjust hardware for proper operation after installation.
- B. Set hinge cam on in-swinging doors to hold doors open when unlatched.
- C. Set hinge cam on out-swinging doors to hold unlatched doors in closed position.

END OF SECTION 10 21 13

**SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION**

SECTION 10 28 00

TOILET AND BATH ACCESSORIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Toilet and bath accessories.
- B. Related Sections include the following:
 - 1. Division 10 Section "Toilet Compartments" for compartments and screens.

1.03 SUBMITTALS

- A. Product Data: Include construction details, material descriptions and thicknesses, dimensions, profiles, fastening and mounting methods, specified options, and finishes for each type of accessory specified.
- B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required. Use designations indicated in the Toilet and Bath Accessory Schedule and room designations indicated on Drawings in product schedule.

1.04 QUALITY ASSURANCE

- A. Source Limitations: Provide products of same manufacturer for each type of accessory unit and for units exposed to view in same areas, unless otherwise approved by Architect.
- B. Product Options: Accessory requirements, including those for materials, finishes, dimensions, capacities, and performance, are established by specific products indicated in the Toilet and Bath Accessory Schedule.

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1. Other manufacturers' products with equal characteristics may be considered. See Division 1 Section "Substitution Procedures."
2. Do not modify aesthetic effects, as judged solely by Architect, except with Architect's approval. Where modifications are proposed, submit comprehensive explanatory data to Architect for review.

1.05 COORDINATION

- A. Coordinate accessory locations with other Work to prevent interference with clearances required for access by disabled persons, proper installation, adjustment, operation, cleaning, and servicing of accessories.
- B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.06 WARRANTY

- A. General Warranty: Special warranty specified in this Article shall not deprive City of other rights City may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Manufacturer's Mirror Warranty: Written warranty, executed by mirror manufacturer agreeing to replace mirrors that develop visible silver spoilage defects within minimum warranty period indicated.
 1. Minimum Warranty Period: 15 years from date of Project Acceptance.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Bobrick Washroom Equipment, Inc. (Model numbers indicated)
- B. American Specialities, Inc
- C. Bradley Corporation
- D. Or approved equal.

2.02 MATERIALS

SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION

- A. Stainless Steel: ASTM A 666, Type 304, with No. 4 finish (satin), in 0.0312-inch (0.8-mm) minimum nominal thickness, unless otherwise indicated.
- B. Brass: ASTM B 19, leaded and unleaded flat products; ASTM B 16 (ASTM B 16M), rods, shapes, forgings, and flat products with finished edges; ASTM B 30, castings.
- C. Sheet Steel: ASTM A 366/A 366M, cold rolled, commercial quality, 0.0359-inch (0.9-mm) minimum nominal thickness; surface preparation and metal pretreatment as required for applied finish.
- D. Galvanized Steel Sheet: ASTM A 653/A 653M, G60 (Z180).
- E. Chromium Plating: ASTM B 456, Service Condition Number SC 2 (moderate service), nickel plus chromium electrodeposited on base metal.
- F. Baked-Enamel Finish: Factory-applied, gloss-white, baked-acrylic-enamel coating.
- G. Mirror Glass: ASTM C 1036, Type I, Class 1, Quality q2, nominal 6.0 mm thick, with silvering, electroplated copper coating, and protective organic coating complying with FS DD-M-411.
- H. Galvanized Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
- I. Fasteners: Screws, bolts, and other devices of same material as accessory unit, tamper and theft resistant when exposed, and of galvanized steel when concealed.

2.03 FABRICATION

- A. General: One, maximum 1-1/2-inch- (38-mm-) diameter, unobtrusive stamped manufacturer logo, as approved by Architect, is permitted on exposed face of accessories. On interior surface not exposed to view or back surface of each accessory, provide printed, waterproof label or stamped nameplate indicating manufacturer's name and product model number.
- B. General: Names or labels are not permitted on exposed faces of accessories. On interior surface not exposed to view or on back surface of each accessory, provide printed, waterproof label or stamped nameplate indicating manufacturer's name and product model number.

SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION

- C. Surface-Mounted Toilet Accessories: Unless otherwise indicated, fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with continuous stainless-steel hinge. Provide concealed anchorage where possible.
- D. Recessed Toilet Accessories: Unless otherwise indicated, fabricate units of all-welded construction, without mitered corners. Hang doors and access panels with full-length, stainless-steel hinge. Provide anchorage that is fully concealed when unit is closed.
- E. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to City's representative.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
- B. Secure mirrors to walls in concealed, tamper-resistant manner with special hangers, toggle bolts, or screws. Set units level, plumb, and square at locations indicated, according to manufacturer's written instructions for substrate indicated.
- C. Install grab bars to withstand a downward load of at least 250 lbf (1112 N), when tested according to method in ASTM F 446.

3.02 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation and verify that mechanisms function properly. Replace damaged or defective items.
- B. Remove temporary labels and protective coatings.
- C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

3.03 TOILET AND BATH ACCESSORY SCHEDULE

SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION

- A. Combination Towel Dispenser/Waste Receptacle, B-3803 (1 per restroom):
 - 1. Recessed Type: Designed for nominal 6-inch (100-mm) wall depth with continuous, seamless wall flange; towel dispenser in unit's upper compartment designed to dispense minimum of 600 C-fold or 800 multifold paper towels; waste receptacle in unit's lower compartment with minimum 6-gal. capacity, reusable, vinyl liner; and flush doors on upper and lower compartments with continuous hinges and tumbler locksets.

- B. Grab Bars, B-6806:
 - 1. Stainless-Steel Nominal Thickness: Minimum 0.05 inch (1.3 mm).
 - 2. Mounting: Concealed with manufacturer's standard flanges and anchors.
 - 3. Gripping Surfaces: Manufacturer's standard slip-resistant texture.
 - 4. Outside Diameter: 1-1/2 inches (38 mm) for heavy-duty applications.

- C. Mop and Broom Holder, B-239 (1 per ea Janitor Room):
 - 1. Mop and Broom Holder with Utility Shelf: 36-inch- (914-mm-) long unit fabricated of minimum nominal 0.05-inch- (1.3-mm-) thick stainless steel with shelf; support brackets for wall mounting; three hooks for wiping rags; four spring-loaded, rubber hat, cam-type, mop/broom holders mounted on front of shelf; and approximately 1/4-inch- (6-mm-) diameter, stainless-steel rod suspended beneath shelf for drying rags.

- D. Toilet Tissue Dispenser, B-2888 (1 per each toilet stall)

- E. Toilet Seat Cover Dispenser, B-221 (1 per each toilet stall)

- F. Sanitary Napkin Receptacle, B-254 (1 per each women's toilet stall)

- G. Soap Dispenser, B-8221 (1 per each lavatory basin)

- H. Baby Changing Station, B-2210, with paper liners, part No. 2210-40, (1 per each restroom)

- I. Continuous 3/16" thick glass mirror per Interior elevations (1 per each restroom)

END OF SECTION 10 28 00

SECTION 10 56 20

METAL STORAGE SHELVING

PART 1 - GENERAL

1.1 Summary: Section Includes:

- A. Four-post metal storage shelving.
 - 1. Design: Post uprights supporting shelves that span between the posts.
 - 2. Shelves: Solid-metal, slotted-metal, or wire. Shelves are supported by mechanical attachment (nuts and bolts) or adjustable shelf clips fastened into holes in the posts. Some posts have integral tabs that support the shelves. Shelves supported by shelf clips are easier to adjust than mechanically attached shelves.
 - 3. Four-post shelving can be installed as closed shelving by enclosing the unit with rear and end panels.
- B. Wall mounted metal storage shelving using heavy duty standards and brackets.

PART 2 – PRODUCTS

2.1 Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- A. Penco Products, Inc.
- B. Lyon Workspace Products, LLC.
- C. Spacesaver Corporation.
- D. Or equal.

2.2 Materials:

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with G60 (Z180) zinc (galvanized) or A60 (ZF180) zinc-iron-alloy (galvannealed) coating.
- C. Steel Tubing: ASTM A 513, Type 2.
- D. Steel Wire: ASTM A 899.
- E. Floor Anchors: Galvanized-steel, post-installed expansion anchors. Provide number per unit recommended by manufacturer unless additional anchors are indicated in calculations.

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- F. Wall Anchors: Manufacturer's standard, galvanized-steel anchors designed to secure metal storage shelving to adjacent wall. Provide one per shelving unit for each shelving unit adjacent to a wall unless additional anchors are indicated in calculations.

2.3 Four-Post Metal Storage Shelving:

- A. Open Four-Post Metal Storage Shelving: Factory-formed, field-assembled, freestanding system, designed for shelves to span between and be supported by corner posts, with shelves adjustable over the height of shelving unit.
1. Load-Carrying Capacity per Shelf: 350 lb (159 kg).
 2. Posts: Fabricated from hot-rolled steel; in manufacturer's standard shape; with perforations at 1-1/2 inches (38 mm) o.c. to receive shelf-to-post connectors.
 3. Bracing: Manufacturer's standard, double diagonal cross bracing at back and ends; as required for stability, load-carrying capacity of shelves, and number of shelves. Provide seismic bracing as required by Code.
 4. Back Panel: One piece fabricated from cold-rolled steel sheet.
 - a) Steel-Sheet Thickness, Nominal: As required for load-carrying capacity per shelf.
 5. End Panels: Fabricated from cold-rolled steel sheet.
 6. Solid-Type Shelves: Fabricated from steel sheet.
 7. Shelf-to-Post Connectors: Mechanical fasteners (nuts and bolts).
 8. Base: Closed, with base strips fabricated from same material and with same finish as shelving.
 9. Finish: Baked enamel or powder coat.

2.4 Fabrication

- A. Shop Fabrication: Prefabricate shelving components in shop to greatest extent possible to minimize field fabrication; temporarily preassemble shelving components where necessary to ensure that field-assembled components fit together properly. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Fabricate metal storage shelving square and rigid, with posts plumb and true and shelves flat and free of dents or distortion. Fabricate connections to form a rigid structure, free of buckling and warping.

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- C. Form metal in maximum lengths to minimize joints. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing the Work. Form backs of shelving units up to 48 inches (1219 mm) wide from one piece.
- D. Weld corners and seams continuously to develop strength, minimize distortion, and maintain the corrosion resistance of base metals. At exposed locations, finish welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface. Weld before finishing components to greatest extent possible. Remove weld spatter and welding oxides from exposed surfaces before finishing.

2.5 Metallic-Coated Steel-Sheet Finishes

- A. Surface Preparation: Clean surfaces with nonpetroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint, complying with SSPC-Paint 20, to comply with ASTM A 780.
- B. Baked-Enamel or Powder-Coat Finish: Manufacturer's standard baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry thickness.

2.6 Steel Finishes:

- A. Surface Preparation: Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning" or SSPC- SP 8, "Pickling."
- B. Baked-Enamel or Powder-Coat Finish: Manufacturer's standard baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry thickness.
 - 1. Color: White, manufacturer's standard.

2.7 Wall Mounted Metal Shelving: Heavy-Duty Metal Shelving: Knappe & Vogt Manufacturing Company; or equal.

- A. Wall Standards: 48-inch Series 87 ANO 48, 12 gauge steel.
- B. Adjustable Brackets: Reinforced brackets lock into slotted standards that mount to every type of wall. To ensure the brackets stay in place and the shelving remains stable, every bracket includes an easy-to-operate lock mechanism.
- C. Size: 12-inch 12-gauge steel.
- D. Product: KV Series 187LL ANO 12; or equal.

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- E. Shelving Units: 14-gauge galvanized steel.
- F. Product: KV Series 1987 GALV 12 X 32; or equal.

PART 3 - EXECUTION

- 3.1 Execution: Install metal storage shelving level, plumb, square, rigid, true, and with shelves flat and free of dents or distortion. Make connections to form a rigid structure, free of buckling and warping. Comply with manufacturer's instructions, fully anchored and seismically braced.
 - A. Wall Mounted Shelving: Install standards for adjustable shelf brackets according to manufacturer's written instructions, spaced not more than 32 inches (800 mm) o.c. Fasten directly to wall studs or metal backing as detailed. Space fasteners not more than 12 inches (300 mm) o.c.
 - 1. Brackets: Place the bracket into the standard slots. Twist the lever into the locking position.
 - 2. Shelving: Install shelving units according to manufacturer's written instructions with recommended fasteners.

END OF SECTION 10 56 20

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SECTION 11 68 13

PLAY EQUIPMENT

PART 1 - GENERAL

1.1 SCOPE

- A. Furnish and install all play equipment and protective surfacing as shown and specified,

1.2 STANDARDS

- A. Unless otherwise shown or specified, all materials and methods shall, at a minimum, conform to the California Code of Regulations, Health and Safety Code, Division 104 Environmental Health, part 10 Recreational Safety, Chapter 4 Safe Recreational Land Use, Article 1 Playgrounds.
- B. In addition to the above, all materials and methods must meet the following standards: Consumer Product Safety Commission “Handbook for Public Playground Safety” current version, ASTM F1487 “Standard Consumer Safety Performance Specification for Playground Equipment for Public Use” current version, ASTM F-1292, “Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment” current version, and DOJ 2010 Standard for Accessible Design, Section 1008 Play Areas.
- C. All components of the play equipment shall be certified by International Play Equipment Manufacturers Association (IPEMA).
- D. All protective surfacing, with the exception of sand, shall meet ASTM F-1951 “Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment”, current version.
- E. Wood fiber material shall meet the requirements of the Federal Hazardous Substances Act as determined by testing method described in 16 CFR 1500.44 of Title 16, Chapter II, Subchapter C for rigid and pliable solids. Engineered wood fiber shall also meet ASTM F-2075 “Standard Specifications for Engineered Wood Fiber for Use as a Playground Safety Surface Under and Around Playground Equipment”, current version.

- 1.3 SUBMITTALS: Prior to the purchase of the items and within 10 days after award of contract, Contractor shall submit the following items to Engineer for review and approval. No materials for this section shall be purchased until such approval is granted. Incomplete submittals shall be returned without review.

- A. Play equipment:

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1. Plan view drawing of play equipment at eighth scale with overall dimensions, all components labeled, and deck heights shown.
 2. Isometric drawing of play equipment.
 3. Listing of color and finish for posts, plastic components, decks and accessories.
 4. Post-construction certification of compliance by a Certified Playground Safety Inspector (see section 3.1 below).
 5. Certificate of compliance with International Play Equipment Manufacturers Association (IPEMA).
 6. Manufacturer's five-year full warranty for all components for coverage against structural failure due to corrosion, deterioration, or workmanship. Supplemental coverage as offered by manufacturer.
 7. Delivery schedule
- B. Protective surfacing, engineered wood fiber surfacing:
1. One pint sample of fiber.
 2. Manufacturer's test data identifying the critical height of material per specified surfacing depth.
 3. Certification of compliance with ASTM F1951 "Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment", current version.
 4. Certification of compliance with ASTM F2075 "Standard Specification for Engineered Wood Fiber for Use as a Playground Safety Surface Under and Around Playground Equipment", current version.
 5. Manufacturer's flammability test data.

PART 2 - PRODUCTS

- 2.1 YOUTH PLAY EQUIPMENT: Shall be as shown on the plans and composed of equipment by Landscape Structures "McKinley Park Opt. 2 – Quote #1155394-2-2 00035521" as available from Ross Recreation (Nick Philbin) (855)892-3240, or equal.
- 2.2 PROTECTIVE SURFACING, ENGINEERED WOOD FIBER:
- A. Play Area Wood Fiber: shall consist of shredded virgin wood containing no soil, bark, leaf debris, or twigs. Wood fibers shall be randomly sized, approximately ten times longer than wide and not exceeding 1-1/2 inches in length.

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Percent Passing Through Sieve

<u>Sieve Size</u>	<u>Passing by Weight</u>
3/8"	75% minimum
No. 10	20% maximum
No. 60	5% maximum

B. Geotextile Fabric: Polyester, non-woven engineering fabric meeting the following minimum criteria:

1. Fabric Weight (oz/yd ²)	4.5
2. Thickness (mils) (ASTM D-1777)	85
3. Grab Strength (LB, MC/CD*) (ASTM D-1682)	130/110
4. Grab Elongation (% , MD/CD) (ASTM -1682)	85/95
5. Trapezoid Tear Strength (LB, MD/CD) (ASTM D-1117)	50/45
6. Puncture Strength - 5/16" (LB) (ASTM D-751)	60
7. Mullen Burst Strength (PSI) (ASTM D-3786)	220

*MD = Machine Direction, CD = Cross Machine Direction

2.5 FINISHES: All galvanized steel parts shall be treated with a rust inhibitor prior to painting. Painted components shall be painted by means of an electrostatically applied powder coating. Powder coating shall comply with ASTM D-3359B (adhesion), D-3363 (hardness), and D-2794 (impact). Vinyl or plastic coated components shall have coating applied via a bath. Minimum coating thickness of .080 inches.

PART 3 – EXECUTION

3.1 COMPLIANCE: Contractor shall assemble and install playground equipment in compliance with the written instructions of the manufacturer. Prior to its first use, the playground equipment shall be inspected by a Certified Playground Safety Inspector who shall certify in writing that the equipment is in compliance with the playground-related standards set forth by the American Society for Testing and Materials and the playground-related guidelines set forth by the U.S. Consumer Product Safety Commission.

3.2 LAYOUT: Prior to commencing installation, Contractor shall stake layout of play equipment and use zones and request a review by the Owner's Representative. Contractor is responsible for adjusting layout as required.

3.3 INSTALLATION

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- A. Contractor shall field verify all post lengths for play structures, after excavating play area subgrade and prior to ordering play structures.

END OF SECTION 11 68 13

SECTION 12 24 13

ROLL DOWN WINDOW SHADES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Manually operated sunscreen roller shades.
- B. Local group and master control system for shade operation with addressable motors.

1.2 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry: Wood blocking and grounds for mounting roller shades and accessories.
- B. Section 09 29 00 - Gypsum Board Assemblies: Coordination with gypsum board assemblies for installation of shade pockets, closures and related accessories, where shown.
- C. Section 09 51 23 - Acoustical Panel Ceilings: Coordination with acoustical ceiling systems for installation of shade pockets, closures and related accessories.

1.3 REFERENCES

- A. ASTM G 21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- B. NFPA 70 - National Electrical Code.
- C. NFPA 701-99 - Fire Tests for Flame-Resistant Textiles and Films.

1.4 SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Styles, material descriptions, dimensions of individual components, profiles, features, finishes and operating instructions.
 - 3. Storage and handling requirements and recommendations.
 - 4. Mounting details and installation methods.
 - 5. Typical wiring diagrams including integration of motor controllers with building management system, audiovisual and lighting control systems as applicable.

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- B. Shop Drawings: Plans, elevations, sections, product details, installation details, operational clearances, wiring diagrams and relationship to adjacent Work.
- C. Window Treatment Schedule: For all roller shades. Use same room designations as indicated on the Drawings and include opening sizes and key to typical mounting details.
- D. Selection Samples: For each finish product specified, one set of shade cloth options and aluminum finish color samples representing manufacturer's full range of available colors and patterns. (12'x12")
- E. Maintenance Data: Methods for maintaining roller shades, precautions regarding cleaning materials and methods, instructions for operating hardware and controls.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Obtain roller shades through one source from a single manufacturer with a minimum of (10) ten years experience in manufacturing products comparable to those specified in this section.
- B. Installer Qualifications: Installer trained and certified by the manufacturer with a minimum of (3) three years experience in installing products comparable to those specified in this section.
- C. Fire-Test-Response Characteristics: Passes NFPA 701-99 small and large-scale vertical burn. Materials tested shall be identical to products proposed for use.
- D. Electrical Components: NFPA Article 100 listed and labeled by either UL or ETL or other testing agency acceptable to authorities having jurisdiction, marked for intended use, and tested as a system. Individual testing of components shall not be acceptable in lieu of system testing.
- E. Anti-Microbial Characteristics: 'No Growth' per ASTM G 21 results for fungi ATCC9642, ATCC 9644, ATCC9645.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver shades in factory-labeled packages, marked with manufacturer and product name, fire-test-response characteristics, and location of installation using same room designations indicated on Drawings and in the Window Treatment Schedule.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Install roller shades after finish Work including painting is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.8 WARRANTY

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- A. Warranty: Provide manufacturer's written warranty in which manufacturer agrees to repair or replace roller shades or components that fail in materials or workmanship within specified warranty period as indicated below. Manufacturer may not disclaim any implied warranty such as merchantability or fitness for a particular purpose. Both the expressed and implied terms of the warranty shall be read together for the benefit of the City.
1. Roller Shade Hardware, Chain and Shadecloth: Non-depreciating twenty-five year limited warranty.
 2. Roller Shade Motors: Non-depreciating five-year warranty.
 3. Roller Shade defects from Installation: shall be repaired 2 years from date of Project Acceptance, not including scaffolding, lifts or other means to reach inaccessible areas.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: MechoShade Systems – Mecho/5, Draper, or approved equal.
- B. Substitutions: Substitutions shall be submitted in writing and Architect shall have final authority of acceptance. Refer to Division 1, 01 25 00 “Substitution Procedures” of these Project specifications.

2.2 APPLICATIONS/SCOPE

- A. Roller Shade Schedule:

Provide window coverings at all interior & exterior window locations at windows with a head height of 14' and below:

1. Shade Type 1: Manual operating, chain drive, sunscreen roller shades in all exterior windows of rooms and spaces shown on the Drawings.

2.3 SHADE CLOTH

- A. Visually Transparent Single-Fabric Shadecloth: MechoShade Systems, Inc., ThermoVeil group, single thickness non-raveling 0.030-inch (0.762 mm) thick vinyl fabric, woven from 0.018-inch (0.457 mm) diameter extruded vinyl yarn comprising of 21 percent polyester and 79 percent reinforced vinyl, in colors selected from manufacturer's full range.
1. Dense Basket Weave: "1500 series", 3 percent open, 2 by 2 dense basket-weave pattern
 - a. Color: Selected from manufacturer's full range of colors.
 - b. At Exterior Windows

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- B. Visually Transparent Single-Fabric Shadecloth: MechoShade Systems, Inc., EuroTwill "6000" Series: 0.010 diameter (0.254 mm) non-raveling vinyl/polyester yarn, fabric thickness 0.025 inches (0.635 mm)., or approved equal.
 - 1. Extra Dense Twill Weave "6000" series, 2-3 percent open.
 - a. Color: Selected from manufacturer's full range of colors.
 - b. At Interior Windows

2.4 SHADE BAND

- A. Shade Bands: Construction of shade band includes the fabric, the hem weight, hem-pocket, shade roller tube, and the attachment of the shade band to the roller tube. Sewn hems and open hem pockets are not acceptable.
 - 1. Hem Pockets and Hem Weights: Fabric hem pocket with RF-welded seams (including welded ends) and concealed hem weights. Hem weights shall be of appropriate size and weight for shade band. Hem weight shall be continuous inside a sealed hem pocket. Hem pocket construction and hem weights shall be similar, for all shades within one room.
 - 2. Shade band and Shade Roller Attachment:
 - a. Use extruded aluminum shade roller tube of a diameter and wall thickness required to support shade fabric without excessive deflection. Roller tubes less than 1.55 inch (39.37 mm) in diameter for manual shades, and less than 2.55 inches (64.77 mm) for motorize shades are not acceptable.
 - b. Provide for positive mechanical engagement with drive / brake mechanism.
 - c. Provide for positive mechanical attachment of shade band to roller tube; shade band shall be made removable / replaceable with a "snap-on" snap-off" spline mounting, without having to remove shade roller from shade brackets.
 - d. Mounting spline shall not require use of adhesives, adhesive tapes, staples, and/or rivets.
 - e. Any method of attaching shade band to roller tube that requires the use of: adhesive, adhesive tapes, staples, and/or rivets are not acceptable.

2.5 SHADE FABRICATION

- A. Fabricate units to completely fill existing openings from head to sill and jamb-to-jamb, unless specifically indicated otherwise.
- B. Fabricate shadecloth to hang flat without buckling or distortion. Fabricate with heat-sealed trimmed edges to hang straight without curling or raveling.

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Fabricate unguided shadecloth to roll true and straight without shifting sideways more than 1/8 inch (3.18 mm) in either direction per 8 feet (2438 mm) of shade height due to warp distortion or weave design. Fabricate hem as follows:

1. Bottom hem weights.
- C. Provide battens in standard shades as required to assure proper tracking and uniform rolling of the shadebands. Contractor shall be responsible for assuring the width-to-height (W:H) ratios shall not exceed manufacturer's standards or, in absence of such standards, shall be responsible for establishing appropriate standards to assure proper tracking and rolling of the shadecloth within specified standards. Battens shall be roll-formed stainless steel or tempered steel, as required.
- D. For railroaded shadebands, provide seams in railroaded multi-width shadebands as required to meet size requirements and in accordance with seam alignment as acceptable to Architect. Seams shall be properly located. Furnish battens in place of plain seams when the width, height, or weight of the shade exceeds manufacturer's standards. In absence of such standards, assure proper use of seams or battens as required to, and assure the proper tracking of the railroaded multi-width shadebands.
- E. Provide battens for railroaded shades when width-to-height (W:H) ratios meet or exceed manufacturer's standards. In absence of manufacturer's standards, be responsible for proper use and placement of battens to assure proper tracking and roll of shadebands.

2.6 COMPONENTS

- A. Access and Material Requirements:
 1. Provide shade hardware allowing for the removal of shade roller tube from brackets without removing hardware from opening and without requiring end or center supports to be removed.
 2. Provide shade hardware that allows for removal and re-mounting of the shade bands without having to remove the shade tube, drive or operating support brackets.
 3. Use only Delrin engineered plastics by DuPont for all plastic components of shade hardware, or approved equal. Styrene based plastics, and /or polyester, or reinforced polyester will not be acceptable.
- B. Manual Operated Chain Drive Hardware and Brackets:
 1. Provide for universal, regular and offset drive capacity, allowing drive chain to fall at front, rear or non-offset for all shade drive end brackets. Universal offset shall be adjustable for future change.

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2. Provide hardware capable for installation of a removable fascia, for both regular and/or reverse roll, which shall be installed without exposed fastening devices of any kind.
3. Provide shade hardware system that allows for removable regular and/or reverse roll fascias to be mounted continuously across two or more shade bands without requiring exposed fasteners of any kind.
4. Provide shade hardware system that allows for operation of multiple shade bands (multi-banded shades) by a single chain operator, subject to manufacturer's design criteria. Connectors shall be offset to assure alignment from the first to the last shade band.
5. Provide shade hardware system that allows multi-banded manually operated shades to be capable of smooth operation when the axis is offset a maximum of 6 degrees on each side of the plane perpendicular to the radial line of the curve, for a 12 degrees total offset.
6. Provide positive mechanical engagement of drive mechanism to shade roller tube. Friction fit connectors for drive mechanism connection to shade roller tube are not acceptable
7. Provide shade hardware constructed of minimum 1/8-inch (3.18 mm) thick plated steel or heavier as required to support 150 percent of the full weight of each shade.

2.7 ACCESSORIES

A. Fascia (for outside mount shades)

1. Continuous removable extruded aluminum fascia that attaches to shade mounting brackets without the use of adhesives, magnetic strips, or exposed fasteners.
2. Fascia shall be able to be installed across two or more shade bands in one piece.
3. Fascia shall fully conceal brackets, shade roller and fabric on the tube.
4. Provide bracket / fascia end caps where mounting conditions expose outside of roller shade brackets.
5. Notching of Fascia for manual chain shall not be acceptable.
 - a. Color: Selected from manufacturer's full range of colors.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

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3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the Project conditions.

3.3 INSTALLATION

- A. Install roller shades level, plumb, square, and true according to manufacturer's written instructions, and located so shade band is not closer than 2 inches (50 mm) to interior face of glass. Allow proper clearances for window operation hardware.
- B. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.
- C. Clean roller shade surfaces after installation, according to manufacturer's written instructions.
- D. Engage Installer to train City's maintenance personnel to adjust, operate and maintain roller shade systems.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Project Acceptance.

END OF SECTION 12 24 13

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SECTION 13 11 00

SWIMMING POOL GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 WORK INCLUDED

- A. The scope of the work included under this Section of the Specifications shall include swimming pool(s) as illustrated on the Drawings and specified herein. The General and Supplementary Conditions of the Specifications shall form a part and be included under this Section of the Specifications. The Swimming Pool Subcontractor shall provide all supervision, labor, material, equipment, machinery, plant and any and all other items necessary to complete the work. ALL OF THE WORK IN SECTIONS 13 11 00 – 13 11 08 IS TO BE THE RESPONSIBILITY OF ONE EXPERIENCED SWIMMING POOL SUBCONTRACTOR PRIMARILY ENGAGED IN THE CONSTRUCTION OF COMMERCIAL PUBLIC-USE SWIMMING POOLS. A SWIMMING POOL SUBCONTRACTOR SHALL BE CONSIDERED PRIMARILY ENGAGED AS REQUIRED HEREIN IF THE SUBCONTRACTOR DERIVED 50% OF ITS ANNUAL REVENUE FROM PUBLIC-USE SWIMMING POOL CONSTRUCTION FOR EACH OF THE LAST FIVE YEARS. THE SUBCONTRACTOR MUST HAVE ALSO, IN THE LAST FIVE YEARS CONSTRUCTED AT LEAST FIVE (5) COMMERCIALY DESIGNED MUNICIPAL AND PUBLIC-USE SWIMMING POOLS, EACH OF WHICH SHALL HAVE INCORPORATED A MINIMUM SIZE OF 6,000 SQUARE FEET OF WATER SURFACE AREA WITH A CONCRETE AND CERAMIC TILE PERIMETER OVERFLOW GUTTER AND SELF-MODULATING BALANCE TANK. The Swimming Pool Subcontractor shall furnish and install the swimming pool structures, finishes, cantilever forming, swimming pool mechanical and electrical systems, and all accessories necessary for a complete, functional swimming pool system, as herein described. Work shall include start-up, instruction of Owner's personnel, as-built drawings and warranties as required.

1.2 CODES, RULES, PERMITS, FEES

- A. The swimming pools shall be constructed in strict accordance with the applicable provisions set forth by authorities having jurisdiction over swimming pool construction and operation in the State of California.
- B. The Swimming Pool Subcontractor shall give all necessary notices, obtain all permits, and pay all government sales taxes, fees, and other costs in connection with their work; file all necessary plans, prepare all documents and obtain all necessary approvals of governmental departments having jurisdiction; obtain all required certificates of

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inspection for their work and deliver same to the Designated Representative before request for acceptance and final payment for the work.

- C. The Swimming Pool Subcontractor shall include in the work any labor, materials, services, apparatus, or drawings in order to comply with all applicable laws, ordinances, rules and regulations, whether or not shown on Drawings and/or specified.
- D. The Contractor shall submit all required documents and materials to all Governmental Departments having jurisdiction for any deferred approval items or substituted materials or products to obtain final approval to installation.

1.3 DESCRIPTION OF WORK

- A. Furnish and perform supervision, coordination, all layout, formwork, excavation, hand trim, disposing off-site of all unused material or debris to complete the swimming pool excavation to the dimensions shown on the plans.
- B. Furnish and install complete swimming pool structures, including reinforcing steel and cast-in-place or pneumatically placed concrete walls and floors.
- C. Furnish and install swimming pool finishes, including ceramic tile and marble plaster or other waterproof finishes.
- D. Furnish and install complete swimming pool mechanical system(s), including, but not limited to, circulation systems, filtration systems, pool water heating systems, water chemistry control systems, domestic water fill line systems, booster pump and special effects systems, and all pumps, piping, valves, and connections between system(s) and swimming pool(s).
- E. Furnish and install complete swimming pool electrical system(s) from P.O.C. in Mechanical Room, including, but not limited to, underwater lighting systems, water level control systems, timing systems, scoreboards, special effects systems, control circuitry, motor starters, time clocks, bonding, and all conduits, conductors, contactors, and switches between the system(s) and swimming pool(s).
- F. Furnish and install all swimming pool cantilever forming, deck equipment and required anchors and inserts for the specified equipment as required by code, shown on the Drawings and specified herein.
- G. After the initial filling of the swimming pool system(s), should any repairs, continuing work, or other Subcontractor responsibility require drainage or partial drainage of the swimming pool systems, the Swimming Pool Subcontractor shall be responsible for any subsequent refilling and shall complete the project with the swimming pool system(s) full of water,

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water in chemical balance, complete in every way, and in full operation.

1.4 ASSIGNED RESPONSIBILITIES AND RELATED WORK

- A. It is the intent of this section of the Specifications to clarify Work responsibilities of the trades directly and indirectly involved in construction of the pool systems. All labor, equipment, materials and supplies furnished by the Swimming Pool Subcontractor and other Subcontractors per the contractual agreement with the General Contractor an Owner and shall be as directed by the Owner through their Designated Representative.
- B. THE SWIMMING POOL SUBCONTRACTOR SHALL NOT SUBCONTRACT ANY PORTION OF THE SWIMMING POOL CONSTRUCTION OR SWIMMING POOL EQUIPMENT INSTALLATION TO ANYONE OTHER THAN A SUBCONTRACTOR THAT SATISFIES THE REQUIREMENTS OF SECTION 13 11 00
- C. References to “swimming pool systems” shall include the swimming pools, equipment, and accessories.
- D. The Owner will provide one complete water filling of the swimming pool(s) but will not assume any responsibility for the swimming pool system(s) until they have been proved fully operational, complete in every way and accepted by the Designated Representative.

1.5 RESPONSIBILITIES OF THE CONTRACTOR

- A. The Contractor shall grade the swimming pool site(s), establish benchmarks, cut and fill as necessary to provide as level an area as possible at swimming pool deck elevation before swimming pool layout.
- B. The Contractor shall be responsible for horizontal dimensions and grade elevations accurately from established lines and benchmarks (as indicated on the Drawings) and be responsible for those grades.
- C. The Contractor shall provide adequate temporary light, electric power, heat and ventilation per Federal and State OSHA requirements to construct the swimming pool system(s).
- D. The Contractor shall not permit any heavy equipment activity over any area or within five (5) feet of any area under which swimming pool piping is buried. There shall be no exceptions to this requirement.
- E. The Contractor shall keep the swimming pool excavation(s) and swimming pool structure(s) free of construction residue and waste materials of their workmen or Subcontractors, removing said material from the swimming pools as required.
- F. The Contractor shall protect the swimming pool(s) from damage caused by their construction equipment and /or workmen and Subcontractors.

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- G. The Contractor shall provide a representative at time of swimming pool start-up to coordinate all trades related to swimming pool system(s).

1.6 RESPONSIBILITIES OF THE MECHANICAL SUBCONTRACTOR

- A. The Mechanical Subcontractor shall be licensed in the State of California and provide written notifications to Swimming Pool Subcontractor and contractor when necessary to excavate and backfill within the swimming pool construction site.
- B. The Mechanical Subcontractor shall not utilize any swimming pool piping trench for installation of any sanitary sewer, storm sewer, domestic water, hot water, chilled water or natural gas line.
- C. The Mechanical Subcontractor shall furnish and install all sanitary sewer piping, including vent stacks (if necessary), for backwash pits, floor drains and floor sinks as required by code, shown on Drawings, and herein specified.
- D. The Mechanical Subcontractor shall furnish and install all storm sewer piping and site drainage systems as required by code, shown on the Drawings, and herein specified.
- E. The Mechanical Subcontractor shall provide a minimum 75 psi water supply for swimming pool construction work within fifty (50) feet of the swimming pool construction site(s).
- F. The Mechanical Subcontractor shall furnish and install reduced pressure backflow protected domestic water lines to P.O.C. within swimming pool Mechanical Room as required by code, shown on the Drawings, and herein specified.
- G. The Mechanical Subcontractor shall furnish and install natural gas piping, pressure regulation and valving to P.O.C. within swimming pool Mechanical Room as required by code, shown on the drawings, and herein specified.
- H. The Mechanical Subcontractor shall furnish and install all ductwork, louvers, and all HVAC equipment within swimming pool Mechanical Room as required by code, shown on the Drawings, and herein specified.
- I. The Mechanical Subcontractor shall provide a representative at time of swimming pool start-up to coordinate work related to swimming pool system(s).

1.7 RESPONSIBILITIES OF THE ELECTRICAL SUBCONTRACTOR

- A. The Electrical Subcontractor shall be licensed in the State of California and shall furnish and install electrical service to swimming pool Mechanical Room sized to accommodate all necessary swimming pool equipment as shown on the Drawings and herein specified.

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- B. The Electrical Subcontractor shall furnish any temporary power needed by the Swimming Pool Subcontractor within fifty (50) feet of the swimming pool construction site(s).
- C. The Electrical Subcontractor shall furnish and install all conduits, conductors, starters/disconnects, panels, circuits, switches and equipment as required for lighting, ventilation and HVAC equipment within swimming pool Mechanical Room as required by code, shown on the Drawings, and herein specified.
- D. The Electrical Subcontractor shall furnish and install all conduits, conductors, panels, circuits, switches and equipment for area lighting as required by code, shown on the Drawings, and herein specified.
- E. All equipment, material and installation shall be as required under Division 16 of the Specifications and shall conform to NEC Article 680 (latest revision), State and Local Codes, and as may be required by all authorities having jurisdiction over swimming pool construction within the State of California.
- F. The Electrical Subcontractor shall provide a representative at time of swimming pool start-up to coordinate work related to swimming pool system(s).

1.8 INTENT

- A. It is the intention of these specifications and Drawings to call for finished work, tested and ready for operation. Wherever the work “provide” is used, it shall mean “furnish and install complete and ready for use.”
- B. Minor details not usually shown or specified, but necessary for proper installation and operation, shall be included in the work, the same as if herein specified or shown.

1.9 SCHEDULE OF VALUES

- A. Provide a Schedule of Values for all work specified in each of the technical specifications listed in the table below, regardless of whether the work is performed by the swimming pool contractor or others. Values listed shall be fully burdened, with contractor general conditions, overhead, profit and bonds included. Payments for swimming pool work completed shall not be approved until Schedule of Values has been submitted to and approved by Architect.

SWIMMING POOL SCHEDULE OF VALUES			
No.	Section #	Description	Value
1.	13 11 02	Swimming Pool Concrete	
2.	13 11 03	Swimming Pool Shotcrete	

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3.	13 11 04	Swimming Pool Ceramic Tile	
4.	13 11 05	Swimming Pool Plaster	
5.	13 11 06	Swimming Pool Equipment	
6.	13 11 07	Swimming Pool Mechanical	
7.	13 11 08	Swimming Pool Electrical	
Total			

1.10 SUBMITTAL PROCEDURES

- A. General: Electronic copies of CAD Drawings of the Contract Drawings will not be provided by Architect for Subcontractor's use in preparing submittals.
- B. Coordination: Coordinate preparation and processing submittals with performance construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - (a) Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for list of submittals and time requirements for schedules performance of related construction activities.
- D. Processing Time: Allow enough time for submittal review, including time for re-submittals as follows. Time for review shall commence on Architect's receipt of submittal.
 - 1. Initial Review: Allow fifteen (15) days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Architect will advise Contract when a submittal being processed must be delayed for coordination.
 - 2. Concurrent Review: Where concurrent review of submittals by Architect's consultants, Owner, or other parties is required, allow twenty-one (21) days for initial review of each submittal.
 - 3. Direct Transmittal to Consultant: Where the Contract Documents indicate that submittals may be transmitted directly to Architect's

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consultants, provide duplicate copy of transmittal to Architect. Submittal will be returned to Architect before being returned to Subcontractor.

4. If intermediate submittal is necessary, process it in same manner as initial submittal.
 5. Allow fifteen (15) days for processing each submittal.
 6. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.
- E. Identification: Place a title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on title block.
 2. Provide a space on title block to record Subcontractor's review and approval markings and action take by Architect.
 3. Include the following information on title block for processing and recording action taken: (See Attached Sample)
 - (a) Project name.
 - (b) Date.
 - (c) Name and address of Subcontractor.
 - (d) Name of Subcontractor.
 - (e) Name of Supplier.
 - (f) Name of Manufacturer.
 - (g) Unique identifier, including revision number.
 - (h) Number and title of appropriate Specification Section.
 - (i) Drawing number and detail references, as appropriate.
 - (j) Other necessary identification.

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SUBMITTAL FOR:

SUBMITTAL TO:

SUBCONTRACTOR:

Item Number:

Section Number: _____

Section Description: _____

Subcontractor: _____

Supplier: _____

Manufacturer: _____

Product Code: _____

Quantity: _____

Subcontractor Certification:

Contractor's Submittal Stamp:

It is hereby certified that the equipment or material designated in this submittal is proposed to be incorporated in the above-named project and is in compliance with the contract drawings and / or specifications and is submitted for approval.

Certified by: _____

Date: _____

Job

Superintendent: _____

Revisions: _____

Architect's Review Stamp and Comments

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- F. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract documents on submittal.
- G. On all catalogue or cut sheets identify which model or type is being submitted.
- H. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Product data and shop drawings shall be packaged within a three-ring binder and colored samples shall be packaged on a heavy cardboard. Transmit each submittal using a transmittal form.
 - 1. On an attached separate sheet, prepared on Subcontractor's letterhead, record relevant information, request for data, revisions other than those requested by Architect on previous submittals and deviations from requirements of the Contract documents, including minor variations and limitations. Include the same label information as the related submittal.
 - 2. Include Subcontractor's certification stating that information submitted complies with requires of the Contract Documents.
 - 3. Transmittal Form: Provide locations on form for the following information:
 - (a) Project name.
 - (b) Date.
 - (c) Destination (To:).
 - (d) Source (From:).
 - (e) Names of Subcontractor, manufacturer, and supplier.
 - (f) Category and type of submittal.
 - (g) Submittal purpose and description.
 - (h) Remarks.
- I. Distribution: Furnish copies of final submittals to manufacturers, Subcontractors, suppliers, fabricators, installers, authorities having jurisdiction and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- J. Use for Construction: Use only final submittals with mark indicating action taken by Architect in connection with construction.

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1.11 SUBSTITUTIONS

- A. To obtain approval to use unspecified products, bidders shall submit requests for substitution at least ten (10) days prior to bid date. Requests shall only be considered if they clearly describe the product for which approval is asked, including all data necessary to demonstrate acceptability. All unspecified products and equipment will be considered on an “or equal” basis at the discretion of the Designated Representative. Requests for substitution received after the specified deadline will not be considered. Where a conflict exists between the requirements of the General Conditions / Special Conditions / Division 1 concerning substitutions and the requirements of this Article, this Article (Section 13 11 00, Article 1.10) shall govern.

- B. Where the Swimming Pool Subcontractor proposes to use an item of equipment other than that specified or detailed on the Drawings which requires any redesign of the structure, partitions, foundations, piping, wiring, or any other part of the architectural, mechanical, or electrical layout, all such redesign and all new drawings (stamped by California Licensed Engineer) and detailing required shall be prepared by the Swimming Pool Subcontractor, at their own expense, submitted for review and approval by the Designated Representative prior to bid.

- C. Where such approved deviation requires a different quantity and arrangement of piping, supports and anchors, wiring, conduit, and equipment from that specified or indicated on the Drawings, the Swimming Pool Subcontractor shall furnish and install any such piping, structural supports, controllers, motors, starters, electrical wiring and conduit, and any other additional equipment required by the system, at no additional cost to the Owner.

1.12 SURVEYS AND MEASUREMENTS

- A. The Swimming Pool Subcontractor shall base all measurements, both horizontal and vertical, from benchmarks established by the Contractor. All work shall agree with these established lines and levels. The mechanical Drawings do not give exact details as to elevations of piping, exact locations, etc. and do not show all offsets, control lines, pilot lines and other installation details. Verify all measurements at site and check the correctness of same as related to the work.

1.13 DRAWINGS

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- A. Drawings are diagrammatic and indicate the general arrangement of the systems and work included in the Subcontractor. Drawings are not to be scaled. The architectural drawings and details shall be examined for exact dimensions. Where they are not definitely shown, this information shall be obtained from the Designated Representative.

1.14 SWIMMING POOL SUBSUBCONTRACTOR

- A. The swimming pool construction work as herein described and specified in Division 13 of the Project Manual shall be the complete responsibility of a qualified and specifically licensed (C-53 license classification within the State of California) Swimming Pool Subcontractor with extensive experience in commercial public use swimming pool installations.
- B. The Contractor shall require the Swimming Pool Subcontractor to furnish to the Contractor performance and payment bonds in the amount of 100% of the Swimming Pool Subcontractor's bid written by a surety Company properly registered in the State of California and listed by the U.S. Treasury. The expense of the bond(s) is to be borne by the Subcontractor. The Contractor shall clearly specify the amount and requirements of the bond(s) in the Contractor's written or published request for subbids. The Contractor's written or published request for subbids shall also specify that the bond(s) expense is to be borne by the Subcontractor.
- C. Subcontractor certifies that it meets the qualifications and experience requirements established in Swimming Pool General Requirements, Section 13 11 00, as follows:
 - 1. Subcontractor has derived 50% of its annual revenue from public-use swimming pool construction for each of the last five (5) years.
 - 2. Subcontractor has, in the last five (5) years, constructed at least five (5) commercially designed municipal and public-use swimming pools, each of which have incorporated a minimum size of 6,000 square feet of water surface area with a concrete and ceramic tile perimeter overflow gutter and self-modulating balance tank.
 - 3. The following list of projects meet the requirements of section (b) above and the contact as reference by the Contractor, the Awarding Authority of their agent or designee.

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a. Owner: _____
Scope of Project: _____
Contact Person: _____
Phone Number: _____
Architect for Project: _____

b. Owner: _____
Scope of Project: _____
Contact Person: _____
Phone Number: _____
Architect for Project: _____

c. Owner: _____
Scope of Project: _____
Contact Person: _____
Phone Number: _____
Architect for Project: _____

d. Owner: _____
Scope of Project: _____
Contact Person: _____
Phone Number: _____
Architect for Project: _____

- D. Swimming Pool Deck Subcontractor other than the swimming pool Subcontractor certifies that it meets the qualifications and experience requirements established in Swimming Pool General Requirements, Section 13 11 00, as follows:
1. Subcontract has, in the last five (5) years, constructed at least five (5) commercially designed cantilevered pool decks over perimeter gutters, each of which have incorporated a minimum size of 6,000 square feet of water surface area of the swimming pool.
 2. The following list of projects meet the requirements of section (b)

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above and the contact as reference by the Contractor, the
Awarding Authority of their agent or designee.

SWIMMING POOL DECK SUBCONTRACTOR

- a. Owner: _____
Scope of Project: _____
Contact Person: _____
Phone Number: _____
Architect for Project: _____

- b. Owner: _____
Scope of Project: _____
Contact Person: _____
Phone Number: _____
Architect for Project: _____

- c. Owner: _____
Scope of Project: _____
Contact Person: _____
Phone Number: _____
Architect for Project: _____

- d. Owner: _____
Scope of Project: _____
Contact Person: _____
Phone Number: _____
Architect for Project: _____

- e. Owner: _____
Scope of Project: _____
Contact Person: _____
Phone Number: _____
Architect for Project: _____

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1.15 OPERATING INSTRUCTIONS

- A. The Swimming Pool Subcontractor shall determine from actual samples of pool water supplied by the Owner, the proper water management program necessary for maximum operating efficiency and comfort. The Swimming Pool Subcontractor shall provide the services of experienced personnel familiar with this type of pool system operation, in conformance with Section 13 11 05 of the Specifications.

1.16 MAINTENANCE MANUALS

- A. The Swimming Pool Subcontractor shall provide six (6) bound sets for delivery to the Designated Representative of instructions for operating and maintaining all systems and equipment included in this Contract. Manufacturer's advertising literature or catalog pictures will not be acceptable for operating and maintenance instructions.
- B. Bound in ring binders shall be all parts lists, periodic maintenance instructions and troubleshooting guidelines for all pool equipment, including but not limited to filters, pumps, controllers, water chemistry control equipment, etc.

1.17 SECURE FROM THE OWNER

- A. A complete Owner-furnished filling of the swimming pools.
- B. The Owner's assistance, as specified herein, from the time of start-up until final written acceptance of the swimming pool system(s).
- C. Chemicals as required for swimming pool operation after Swimming Pool Subcontractor completes initial water chemistry balance and water treatment during the maintenance period described in Section 13 11 05 of the Specifications.

1.18 WARRANTY

- A. The Swimming Pool Subcontractor shall warrant all swimming pool structures, finishes and systems against defects in material and workmanship for a period of one year after the date of acceptance by the Owner. Any repair or replacement required due to defective material or workmanship will be promptly corrected by the Swimming Pool Subcontractor.

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PART 2 PRODUCTS NOT USED

PART 3 EXECUTION NOT USED

END OF SECTION 13 11 00

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SECTION 13 11 02

SWIMMING POOL CONCRETE

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Forming for cast-in-place concrete and shotcrete associated with the swimming pool and pool decks.
- B. Reinforcement for cast-in-place concrete and shotcrete associated with the swimming pool and pool decks.
- C. Cast-in-place concrete for the swimming pool structures. Do not use waterproofing admixture of any kind.
- D. Cast-in-place concrete for swimming pool decks with Xypex C-500 crystalline waterproofing admixture. Waterproofing admixture for swimming pool decks only.
- E. Provide labor, materials and equipment as required to install sealant for all pool deck expansion joints, or any other caulking, as indicated on the aquatic drawings and herein specified.

1.2 QUALITY ASSURANCE

- A. Qualifications of Workers:
 - 1. The entity performing the work of this Section shall have been successfully engaged in the respective trade for at least five (5) years immediately prior to commencement of the Work.
 - 2. For actual construction operations, use only trained and experienced workers with a minimum of three (3) years experience with the materials and methods specified.
 - 3. Provide at least one person who shall be present at all times during execution of the work of this Section, with a minimum of five (5) years experience with the type of materials being installed, the referenced standards, and who shall direct all Work performed under this Section.
- B. Standards:
 - 1. In addition to complying with the California Building Code (latest edition), comply with all pertinent recommendations contained in "Guide to Formwork for Concrete," Publication ACI 347R-18 of the American Concrete Institute.
 - 2. In addition to complying with California Building Code (latest edition), comply with all pertinent recommendations contained in

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“Guide to Presenting Steel Design Details,” Publication ACI 315R-18 of the American Concrete Institute.

3. In addition to complying with all local codes and regulations, comply with all pertinent recommendations contained in American Society for Testing and materials (ASTM); ASTM C 920 “Standard Specification for Elastometric Joint Sealants.”
- C. Tolerances: Construct all swimming pool concrete straight, true, plumb and square within a tolerance horizontally of one in 200 and vertically of one in 2000.

1.3 SUBMITTAL AND SUBSTITUTIONS

- A. Provide submittals in conformance with the requirements of Section 01 33 00. Requests for substitution shall conform to requirements of Article 1.10 of Section 13 11 00.
- B. Samples and Certificates, Concrete Reinforcement:
1. Provide all data and access required for testing as described in Section 01 45 00 of the Specifications.
 2. All material shall bear mill tags with heat number identification. Mill analysis and report shall be made available upon request.
 3. Material not so labeled and identifiable may be required by the Owner to be tested by the testing laboratory selected by the Owner and at no additional cost to the Owner, in which case random samples will be taken for one series of tests from each 2-1/2 tons or fraction thereof of each size and kind of reinforcing steel.
 4. Design mix from batch plant demonstrating previous use history and associated strengths at 28 days.
 5. The Contractor shall submit a mix design stamped and signed by a licensed engineer for approval by the Owner’s Representative prior to any placement of concrete.
 6. The Contractor shall submit a separate mix design stamped and signed by a licensed engineer for the swimming pool decks which contains the specified Xypex C-500 crystalline waterproofing admixture for approval by the Owner’s Representative prior to the placement of concrete.
- C. Submit proof of qualifications as specified in Article 1.02.A of this Section.
- D. Submit reinforcing shop drawings for pool walls, gutters, floors, dike walls and balance tanks, etc. as shown on the construction drawing.

1.4 PRODUCT HANDLING

- A. Delivery: Deliver materials to the Project Site in the manufacturer's original unopened containers with all labels intact and legible.

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- B. Storage: Store materials under cover in a manner to prevent damage and contamination, and store only the specified materials at the Project Site.
- C. Protection: Use all means necessary to protect the swimming pool concrete before, during, and after installation and to protect the installed Work specified in other Sections.
- D. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Owner.

PART 2 PRODUCTS

2.01 CONCRETE FORMWORK

A. Form Materials:

- 1. Form Lumber: All form lumber in contact with exposed concrete shall be new except as allowed for reuse of forms in Part 3 of this Section, and all form lumber shall be one of the following, a combination thereof, or an equal approved in advance by the Owner's Representative.
 - (a) "Plyform," Class I or II, bearing the label of the Douglas Fir Plywood Association; "Inner-Seal" Form as manufactured by Louisiana-Pacific, or approved equal.
 - (b) Douglas Fir-Larch, number two grade, seasoned, surfaced four sides.
- 2. Form Release Agent: Colorless, non-staining, free from oils; chemically reactive agent that shall not impair bonding of paint or other coatings intended for use.

B. Ties and Spreaders:

- 1. Type: All form ties shall be a type which do not leave an open hole through the concrete and which permits neat and solid patching at every hole.
- 2. Design: When forms are removed, all metal reinforcement shall be not less than two (2) inches from the finished concrete surface.
- 3. Wire Ties and Wood Spreaders: Do not use wire ties or wood spreaders.

- C. Alternate Forming Systems: Alternate forming systems may be used subject to the advance approval of the Owner's Representative.

2.02 CONCRETE REINFORCEMENT

- A. Bars: Bars for reinforcement shall conform to "Specifications for Deformed Carbon-Steel Bars for Concrete Reinforcement," ASTM A-615, Grade 60.

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- B. Wire Fabric: Wire fabric shall conform to “Specifications for Carbon Steel Wire and Wire Welded Wire Reinforcement, Plain, and Deformed for Concrete,” ASTM A1064.
- C. Tie Wire: Tie wire for reinforcement shall conform to “Specifications for Carbon Steel Wire and Wire Welded Wire Reinforcement, Plain, and Deformed for Concrete,” ASTM A1064 black annealed 16-gauge tie wire.

2.03 CAST-IN-PLACE CONCRETE

A. Concrete:

- 1. All concrete, unless otherwise specifically permitted by the Owner’s Representative, shall be transit-mixed in accordance with ASTM C94. Concrete for water retaining structures that do not receive a waterproofing finish such as ceramic tile or swimming pool plaster shall contain receive a topical waterproofing finish.
 - 2. The control of concrete production shall be under the supervision of a recognized testing agency, selected by the Owner in accordance with Section 01 25 00 of the Specifications.
 - 3. Quality: All concrete shall have the following minimum compressive strengths at twenty-eight (28) days and shall be proportioned within the following limits:
 - (a) 4,000 psi minimum compressive strength for cast-in-place concrete swimming pool structures.
 - (b) 4,000 psi minimum compressive strength for cast-in-place concrete swimming pool decks with Xypex C-500 waterproofing admixture.
 - (c) 1” maximum size aggregate.
 - (d) 6.0 minimum sacks of cement per cubic yard.*
 - (e) 4” maximum slump.
 - (f) Maximum water to cement ration 0.40-0.50 maximum.
 - (g) Xypex Admix C-500 2%-2.5% by weight of cement content. Contact Xypex Technical Services to confirm dosage. (To be used for swimming pool decks only.)
- * For estimate only: to be determined by mix design.
- 4. Cement: All cement shall be Portland Cement conforming to ASTM C-150, Type II or V, and shall be the product of one manufacturer.
 - 5. Aggregates:
 - (a) Shall conform to “Standard Specifications for Concrete Aggregates,” ASTM C33, except as modified herein.

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- (b) Coarse Aggregate: Clean sound washed gravel or crushed rock. Crushing may constitute not more than 30% of the total coarse aggregate volume. Not more than 5% flat, thin, elongated or laminated material nor more than 1% deleterious material shall be present. 1" aggregate graded from 1/4" to 1", fineness modulus 6.90 to 7.40. 1-1/2" graded from 1/2" to 1-1/2", fineness modulus 7.80 to 8.20.
 - (c) Fine Aggregate: Washed natural sand of hard, strong particles and shall contain not more than 1% of deleterious material, fineness modulus 2.65 to 3.05.
 - (d) Aggregate must be certified, non-expansive from a "known" good source.
6. Water: ASTM C1602 Clean, fresh, free from acid, alkali, organic matter or other impurities liable to be detrimental to the concrete (potable).
7. Admixtures: Admixtures shall be used upon approval of the Owner's Representative.
- (a) Air-entraining admixture: Conform to ASTM C260.
 - (b) Water-reducing admixture: Conform to ASTM C494.
 - (c) Waterproofing admixture for swimming pool decks only: Xypex Admix C-500, no substitutions permitted. Conform to ASTM C494.
8. Xypex Admix C-500 Dosage: To be used for swimming pool decks only.
- (a) General: Xypex Admix must be added to concrete mix at time of batching. It is important to obtain a homogeneous mixture of Xypex Admix with the concrete. Do not add dry Admix powder directly to wet mixed concrete as this could cause clumping and thorough dispersion may not occur.
 - (b) Dosage Rate: Under normal conditions, the crystalline waterproofing powder shall be added to the concrete mix at the following rates:
 - (1) Xypex Admix C-500 2% – 2.5% by weight of cement content
 - (c) Weather Conditions: For mixing, transporting and placing concrete under conditions of high temperature or low temperature, follow concrete practices such as those referred to in ACI 305R (Hot Weather Concreting) and ACI 306R (Cold Weather Concreting) or other applicable standards.

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- (d) Concrete Batching & Mixing Procedures: Procedures for the addition of Xypex admixture will vary according to type of batch plant operation and equipment. Prior to the placement of any concrete, the concrete batch plant and the contractor shall be responsible to consult with the local Xypex representative concerning additional procedures for the addition, mixing and to confirm dosage.

Note: For enhanced chemical protection or for meeting specific project requirements or where the concrete mix design contains higher than 25% type F fly ash content or includes a portland cement/slag cement/type C fly ash blend, consult with manufacturer or its authorized representative to determine appropriate dosage rates
Construction Joints: Use keyform for slab pour joints. Either preformed galvanized or PVC construction joint forms of a standard manufacturer may be used. Install per manufacturer's recommendations and tool edges of slabs.

- B. Waterstops: PVC bulb-type for use between concrete pours / lifts, conforming with ASTM D 570, D 624, and D 638. Provide in configuration(s) as recommended by manufacturer for specific application. Greenstreak, W.R. Meadows, or approved equal.

C. Curing Materials:

1. Liquid Membrane (covered slab): Chlorinated rubber membrane forming, curing-sealing compound conforming to ASTM C309.
2. Liquid Membrane (exposed slab): Clear methyl and butyl methacrylate non-staining, membrane forming, curing-sealing compound conforming to ASTM C309.

E. Cement Grout and Drypack:

1. Cement Grout: Mix 1 part by volume of Portland Cement, 1/2 part by volume of water and fine aggregate enough to make mixture flow under its' own weight.
2. Drypack: Mix 1 part by volume of Portland Cement, 1/2 part by volume of water and fine aggregate enough to make a stiff mix that will mold into a ball. Mix no more than can be used in 30 minutes.

2.04 JOINT SEALANT MATERIALS

- A. Caulking: Multipart, non-sag gun grade polyurethane-based sealant meeting the requirements of ASTM C920-02, Type S or M, Mamemco International, Pecora, Sika Corp., Sonneborn Building Products, Tremco or approved equal. Self-leveling caulking materials are not allowed.
- B. Primer: Non-staining type, recommended by sealant manufacturer to suit

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application.

- C. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- D. Sealant Backer Rod: Provide compressible polyethylene or polyurethane backer rod as recommended by the sealant manufacturer.
- E. Bond Breaker Tape: Provide polyethylene tape or other plastic tape as recommended by sealant manufacturer, to be applied to sealant-contact surfaces where bond to substrate or joint filler must be avoided for proper performance of sealant.
- F. Sand: Cover the surface of the caulking with #30 silica sand.

2.05 OTHER MATERIALS

- A. All other materials, not specifically described but required for proper completion of the work of this Section, shall be as selected by the Contractor subject to the advance review by the Owner's Representative.

PART 3 EXECUTION

3.01 SURFACE CONDITIONS

A. Inspection:

- 1. Prior to all Work of this Section, carefully inspect the installed Work of other trades and verify that all such Work is complete to the point where this installation may properly commence.
- 2. Verify that all Work may be constructed in accordance with all applicable codes and regulations, the referenced standards, and the original design, and in accordance with site specific Geotechnical Report.

B. Discrepancies:

- 1. In the event of discrepancy, immediately notify the Owner's Representative.
- 2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.
- 3. Failure to notify the Owner's Representative and give written notice of discrepancies shall constitute acceptance by the Contractor of existing conditions as fit and proper to receive work.

3.02 CONCRETE FORMWORK

A. Construction of Forms:

- 1. General: Construct all required forms to be substantial, sufficiently tight to prevent leakage of concrete paste, and able to withstand excessive deflection when filled with wet concrete.

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2. Layout:

- (a) Form for all required cast-in-place concrete to the shapes, sizes, lines and dimensions indicated on the Drawings.
- (b) Exercise particular care in the layout of forms to avoid necessity for cutting concrete after placement.
- (c) Make proper provisions for all openings, offsets, recesses, anchorages, blocking and other features of the Work as shown or required.
- (d) Perform all forming required for Work of other trades and do all cutting and repairing of forms required to permit such installation.
- (e) Carefully examine the Drawings and Specifications and consult with other trades as required relative to providing for pipe and conduit penetrations, reglets, chases and other items in the forms.

3. Imbedded Items: Set all required steel frames, angles, bolts, inserts and other such items required to be anchored in the concrete prior to concrete being placed.

4. Bracings:

- (a) Properly brace and tie the forms together so as to maintain position and shape and to ensure safety to workmen.
- (b) Construct all bracing, supporting members and centering of ample size and strength to safely carry, without excessive deflection, all dead and live loads to which they may be subjected.
- (c) Properly space the forms apart and securely tie them together, using metal spreader ties that give positive tying and accurate spreading.

5. Wetting: Keep forms sufficiently wetted to prevent joints from opening up before concrete is placed.

B. Plywood Forms:

- 1. Design: Nail the plywood panels directly to studs and apply in a manner to minimize the number of joints.
- 2. Joints: Make all panel joints tight butt joints with all edges true and square.

C. Footing Forms:

- 1. Wood Forms: All footing forms shall be wood unless otherwise specifically approved by the Owner's Representative, or as specified in

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paragraph 3.02(C)(2).

2. Earth Forms:

- (a) Side walls for footings may be of earth provided the soil will stand without caving and the sides of the bank are made with a neat cut to the minimum dimensions indicated on the Drawings.
- (b) For excavation and backfill of earth forms, conform with applicable provisions of Section 13 11 01.

D. Reuse of Forms:

- 1. Reuse of forms shall be subject to advance approval of the Owner's Representative.
- 2. Except as specifically approved in advance by the Owner's Representative, reuse of forms shall in no way delay or change the schedule for placement of concrete from the schedule obtainable if all forms were new.
- 3. Except as specifically approved in advance by the Owner's Representative, reuse of forms shall in no way impart less structural stability to the forms nor less acceptable appearance to finished concrete.

E. Removal of Forms:

1. General:

- (a) In general, side forms of footings may be removed seven (7) days after placement of concrete, but time may be extended if deemed necessary by the Owner's Representative.
- (b) Forms for footings, foundations, grade beams, slabs, walls, and other formed concrete may be removed fourteen (14) days after placement of concrete.

2. Removal:

- (a) Use all means necessary to protect workers, passersby, the installed Work of other trades and the complete safety of the structure.
- (b) Cut nails and tie wires or form ties off flush and leave all surfaces smooth and clean.
- (c) Remove metal spreader ties on exposed concrete by removing or snapping off inside the wall surface and pointing up and rubbing the resulting pockets to match the surrounding areas.

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- (d) Flush all holes resulting from the use of spreader ties and sleeve nuts using water, and then solidly pack throughout the wall thickness with cement grout applied under pressure by means of a grouting gun; grout shall be one-part Portland Cement to 2-1/2 parts sand; apply grout immediately after removing forms.

3.03 CONCRETE REINFORCEMENT

A. Bending:

1. General:

- (a) Fabricate all reinforcement in strict accordance with the Drawings.
- (b) Do not use bars with kinks or bends not shown on the Drawings.
- (c) Do not bend or straighten steel in a manner that will injure the material. (When opposite end is already encased in concrete.)

2. Design:

- (a) Bend all bars cold.
- (b) Make bends for stirrups and ties around a pin having a diameter of not less than two (2) times the minimum thickness of the bar.
- (c) Make bends for other bars, including hooks, around a pin having a diameter of not less than six (6) times the minimum thickness of the bar.

B. Placing:

- 1. **General:** Before the start of concrete placement, accurately place all concrete reinforcement, positively securing and supporting by concrete blocks, metal chairs or spacers, or by metal hangers.

2. Clearance:

- (a) Preserve clear space between bars of not less than one and one-half (1-1/2) times the nominal diameter of the round bars.
- (b) In no case let the clear space be less than one and one-half (1-1/2) inches nor less than one and one-third (1-1/3) times the maximum size of the aggregate.
- (c) Provide the following minimum concrete covering of reinforcement:

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- (1) Concrete deposited against earth: three (3) inches minimum.
- (2) Concrete below grade deposited against forms: two (2) inches minimum.
- (3) Concrete elsewhere: As indicated on Drawings or otherwise approved by the Owner's Representative.

3. Splicing:

(a) Horizontal Bars:

- (1) Place bars in horizontal members with minimum lap at splices sufficient to develop the strength of the bars.
- (2) Bars may be wired together at laps except at points of support of the member, at which points preserve clear space described above.
- (3) Whenever possible, stagger the splices of adjacent bars.
- (4) Splice forty (40) bar diameters minimum.
- (5) Provide non-contact lap slices for shotcrete.

(b) Wire Fabric: Make all splices in wire fabric at least one and one-half (1-1/2) meshes wide.

(c) Other Splices: Make only those other splices that are indicated on the Drawings or specifically approved by the Owner's Representative.

4. Dowels: Place all required steel dowels and securely anchor them into position before concrete is placed.

5. Obstructions: In the event conduits, piping, inserts, sleeves and other items interfere with placing reinforcement as indicated on the Drawings or otherwise required, immediately consult with the Owner's Representative and obtain approval of a new procedure prior to placing concrete.

C. Cleaning Reinforcement: Steel reinforcement, at the time concrete is placed around it, shall be free from rust scale, loose mill scale, oil, paint and all other coatings which will destroy or reduce the bond between steel and concrete. Bend down all tie wire away from the top of the pool deck. Maintain a 2" clear from top of concrete to tie wire.

3.04 SHOTCRETE REINFORCEMENT

A. The maximum size of reinforcement shall be No. 5 bars unless it can be demonstrated by preconstruction tests that adequate encasement of larger bars can be achieved. When No. 5 or smaller bars are used, there

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shall be a minimum clearance between parallel reinforcement bars of 2-1/2 inches (64 mm). When bars larger than No. 5 are permitted, there shall be a minimum clearance between parallel bars equal to six diameters of the bars used. When two curtains of steel are provided, the curtain nearest the nozzle shall have a minimum spacing equal to 12 bar diameters and the remaining curtain shall have a minimum spacing of six bar diameters.

- B. Lap splices in reinforcing bars shall be by the non-contact lap splice method with at least 2 inches' clearance between bars. The enforcement agency may permit the use of contact lap splices when necessary for the support of the reinforcing provided it can be demonstrated by means of preconstruction testing, that adequate encasement of the bars at the splice can be achieved, and provided that the splices are placed so that a line through the center of the two spliced bars is perpendicular to the surface of the shotcrete work.

3.05 CAST-IN-PLACE CONCRETE

A. Conveying and Placing Concrete:

1. Before placing concrete, mixing and conveying equipment shall be well cleaned, and the forms and space to be occupied by concrete shall be thoroughly cleaned and wetted. Ground water shall be removed until the completion of the work.
2. No concrete shall be placed in any unit of work until all formwork has been completely constructed, all reinforcement has been secured in place, all items to be built into concrete are in place, and form ties at construction joints tightened.
3. Concrete shall be conveyed from mixer to place of final deposit in such a way to prevent the separation or loss of ingredients. It shall be placed as nearly as practicable in its' final position to avoid rehandling or flowing. Concrete shall not be dropped freely where reinforcing bars will cause segregation, nor shall it be dropped freely more than six (6) feet. Use tremies, spouts and dump boxes in deep sections. Vibrators are not acceptable for facilitating concrete transport.
4. Concrete shall be tamped and spaded to insure proper compaction into all parts of forms and around reinforcement. A mechanical vibrator shall be used to thoroughly compact the concrete. Vibration must be by direct action in the concrete and not against forms or reinforcement.
5. Mixing and transport time as indicated in ASTM C94 is required. If air temperatures are between 85° and 90° F the delivery time is to be reduced to 75 minutes. When air temperatures are in excess of 90° F the delivery time should be reduced to 60 minutes.

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6. Truck mixes without batch certificates will be rejected
- B. Construction Joints / Expansion Joints: Construction joints and expansion joints shall be provided at locations and in the manner shown on the Drawings. With exception of existing concrete / new shotcrete joints, use PVC bulb-type waterstops appropriate for design condition between all concrete pours / lifts to avoid cold joints. Waterstops shall be placed in such a way to protect reinforcing steel from rust and oxidation. All expansion joints must be the full depth of the concrete section in which they are located.
- C. Slab Finishes: Concrete slabs shall be compacted and screeded uniformly to grades shown. Push large aggregates below the surface with a screen tamper, screed and bull float. As soon as the surface becomes workable, it shall be wood floated, then finished as indicated on the Drawings to a uniform smooth, true surface in a neat and workmanlike manner. Carefully coordinate slab finish requirements with other trades (ceramic tile, pool plaster) to insure concrete finish is appropriate substrate for final finish material.
1. Contractor shall provide three mock-up deck samples, minimum 2'x 2', with a wedge anchor installed in one sample. These (3) samples shall be constructed; one with a light broom finish, one (1) with a medium broom finish and one (1) with a heavy broom finish for determination and selection of an appropriate deck finish. Each sample shall be edged on all four sides to demonstrate a 3/4" radius edge. Anchor installation shall demonstrate acceptable interface between anchor and the top of deck. Deck samples shall remain on job site through final inspection for reference.
 2. Pool Floor Slab: Heavy Wire Broom Finish.
- D. Protection and Curing:
1. Concrete shall be protected from injurious action of the elements and defacement of any nature during construction.
 2. All forms must be kept wet to prevent drying out of the concrete.
 3. All concrete surfaces including footings must be kept wet for at least seven (7) days after concrete is placed.
 4. Apply the appropriate curing materials, as specified in 2.03 of this Section, immediately after finishing slabs. Application shall be as specified by the manufacturer.
- E. Form Removal:
1. Take care in removing forms so that surfaces are not marred or gouged and that corners are true, sharp and unbroken.

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2. No steel spreaders, ties or other metal shall project from or be visible on any concrete surfaces.

F. Defective Work:

1. Should the strength of any concrete for any portion of the work indicated by tests of molded cylinders and core tests fall below minimum 28 days' strength specified or indicated, concrete will be deemed defective work and shall be replaced.
2. Concrete work that is not formed as indicated, is not true to intended alignment, not plumb or level where so intended, not true to intended grades or elevations, not true to specified or selected finish, contains sawdust shavings, wood, or embedded debris, which exhibits cracks or contains fine or coarse sulfide particles, or expansive aggregates detrimental to performance or appearance of the concrete shall be deemed defective.
3. Promptly perform work required to replace and properly clean (by sandblasting if necessary) any defective concrete panels (control joint or expansion joint to control joint or expansion joint), at Contractor's expense, including all expense of additional inspection, tests, or supervision made necessary as a result of defective concrete.

3.06 EXPANSION JOINTS

- A. Temperatures: Do not install sealants when air temperature is less than 40°F.
- B. Tooling: Tool exposed joints to a slightly concave surface using slicking materials recommended by the manufacturer. The tooling procedure shall press sealant against the sides of the joint. No materials shall be left "feathered" out or smeared on the abutting materials. Completed joints shall have a uniform professional appearance.
- C. Joint Construction: Sealant joint width, thickness and cross-sectional profile to be constructed in strict accordance with the sealant manufacturer's recommendations.
- D. Sand: At the appropriate time cover the sealant with sand to provide a sanded finish.

3.07 CLEAN-UP

- A. Upon completion of the Work of this Section, immediately remove all swimming pool concrete materials, debris and rubbish occasioned by this Work to the approval of the Owner's Representative.

END OF SECTION 13 11 02

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SECTION 13 11 03

SWIMMING POOL SHOTCRETE

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Provide labor, materials and equipment as required to install structural wet mix shotcrete for swimming pool structures as indicated on the Drawings and herein specified.

1.02 QUALITY ASSURANCE

- A. Qualifications of Workers:
 - 1. The entity performing the work of this Section shall have been successfully engaged in the respective trade for at least five (5) years immediately prior to commencement of the Work.
 - 2. For actual construction operations, use only trained and experienced workers with a minimum of three (3) years' experience with the materials and methods specified.
 - 3. Provide at least one person who shall be present at all times during execution of the work of this Section, with a minimum of five (5) years' experience with the type of materials being installed, the referenced standards, and who shall direct all Work performed under this Section.
- B. Standards: Except as otherwise indicated, provide shotcrete per American Concrete Institute Standard ACI 506. In addition, conform to recommendations contained in "Shotcrete," Brochure G-84 as published by the Guniting Contractors Association, Sylmar, California and the California Building Code (latest edition).
- C. Mix Design: The Contractor shall submit a mix design stamped and signed by a licensed engineer for approval by the Owner's Representative prior to any placement of shotcrete. Mix design shall indicate source of aggregate and brands of cement and admixtures used. All mix designs shall take character of locally available aggregate into consideration and make adjustments as necessary to conform with specified design criteria.
- D. Testing and Inspection: A test panel shall be shot, cured, cored or sawn, examined and tested (representing the most congested and difficult project scenario) prior to commencement of the project in accordance with ASTM C1140. All project conditions and personnel shall be represented in the test panel. Additionally, one test panel shall be provided for each 50 yards (or portion thereof) of shotcrete placed for each day or each nozzleman, whichever is greater. The size of the strength test panel shall

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be per the direction of the Special Shotcrete Inspector. At least three (3) cores shall be taken from each test panel. (At least three (3) cores shall be taken from the completed work for each day of shotcrete operation.) Testing shall be performed by the Owner's designated Testing Lab and comply with Section 1908A.10, California Building Code. Continuous inspection of the shotcrete operation by a deputy inspector provided by the Owner shall be required. Inspection of shotcrete work shall comply with Section 1908A of California Building Code, and coring, sampling, soaking and testing per 1908A.5 and 1908A.10 of California Building Code. Contractor shall provide test panels for all required tests. The Contractor shall provide the Owner and Testing Lab 48 hours notice before the start of shotcrete operations.

- E. Tolerances: Construct all swimming pool shotcrete straight, true, plumb and square within a tolerance horizontally of one in 200 and a tolerance vertically of one in 2000.

1.03 SUBMITTALS AND SUBSTITUTIONS

- A. Provide submittals in conformance with the requirements of Section 01 33 00 and ACI 506.2. Requests for substitution shall conform with requirements of Article 1.10 of Section 13 11 00.
- B. Materials List: Within thirty (30) days after issuance of Notice to Proceed, and before shotcrete materials are delivered to the project site, submit to the Owner a complete list of materials proposed to be used in this portion of the Work, showing manufacturer's name and catalog number of all items such as admixtures and curing membranes, and the name and address of the supplier of cement and aggregate to be used.
- C. Submit proof of qualifications as specified in Article 1.02.A of this Section.

1.04 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect shotcrete materials before, during and after installation and to protect the installed Work specified in other Sections.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Owner and at no additional cost to the Owner.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Cement: Cement shall be Type II Portland Cement conforming to ASTM C150. Cement type shall be the same for all shotcrete work.
- B. Aggregate: ASTM C33, washed hard dense durable clean sharp sand from approved pit, free of organic matter and opaline, feldspar, or silicious magnesium substances and containing not more than 3% by weight of deleterious

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substances. Maximum size aggregate for shotcrete is $\frac{3}{4}$ " per CBC 1908A.3. When tested for organic impurities by ASTM C40 method, fine aggregate color not darker than reference standard color. When tested for soundness by ASTM C88 method, grading No. 2 of ASTM C1436, loss after 5 cycles not over 10% of fine aggregate.

- C. Water: Potable, clean, fresh, free from acid, alkali, organic matter or other impurities liable to be detrimental to the shotcrete.
- D. Admixtures: Admixtures shall conform to ASTM C1141 and only be used upon approval of the Owner's Representative.

PART 3 EXECUTION

3.01 EXECUTION

A. Inspection:

- 1. Prior to all Work of this Section carefully inspect the installed Work of other trades and verify that all such Work is complete to the point where this installation may properly commence.
- 2. Verify that items to be imbedded in shotcrete are in place and that shotcrete may be placed to the lines and elevations shown on the Drawings, with all required clearance from reinforcement.

B. Discrepancies:

- 1. In the event of discrepancy, immediately notify the Owner's Representative.
- 2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.
- 3. Failure to notify the Owner's Representative and give written notice of discrepancies shall constitute acceptance by the Contractor of existing conditions as fit and proper to receive the Work.

3.02 PREPARATION

A. General:

- 1. Thoroughly clean all areas where shotcrete is to be placed to insure proper bonding of shotcrete.
- 2. Where shotcrete is to be placed against smooth surfaces (i.e., cast-in-place concrete), sandblast surfaces to receive shotcrete to provide clean aggregate surface, thereby insuring proper bond between materials.

- B. Ground Wires: Adequate ground wires, to be used as screeds, shall be installed to establish the thickness and surface planes of the shotcrete

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work. Ground wires shall be placed so that they are tight and true to line and grade and in such a manner that they can be easily tightened.

3.03 PROPORTIONING AND MIXING

- A. Accurately control proportion of water to Portland cement to produce thorough and uniform hydration of the shotcrete that, when shot, forms a homogeneous mass containing neither sags nor dry sand formation. Proportion by mass per ASTM C94 or by volume per ASTM C685.
- B. Shotcrete shall have a minimum compressive strength of 4,000 PSI at 28 days. Shotcrete material shall have a water/cement ratio of 0.40-0.45 per ACI 506R, Chapter 6, Proportioning and Preconstruction Testing; Section 6.3.3, Wet Mix Process.
- C. Discontinue shotcrete work if the time between the addition of mixing water to cement and aggregate, or cement to aggregates, and placement of shotcrete exceeds ninety (90) minutes when the ambient temperature is below 85 degrees Fahrenheit, or exceeds sixty (60) minutes when the ambient temperature is above 85 degrees Fahrenheit. Batch, mix and deliver wet-mixture shotcrete per ASTM C94 or C685.
- D. Hot Weather Shotcreting – Unless otherwise specified, do not place shotcrete when shotcrete temperature is above 95°F, unless prequalification testing shows that the required quality of materials can be achieved at high temperatures. The temperature of reinforcement and receiving surfaces shall be below 90°F prior to shotcrete placement.
- E. Cold Weather Shotcreting – Unless otherwise specified, shooting may proceed when ambient temperature is 40°F and rising. Stop shooting when ambient temperature is 40°F and falling, unless measures are taken to protect the shotcrete. Shotcrete material temperature, when shot, shall not be less than 50°F. Do not place against frozen surfaces.

3.04 SHOTCRETE PLACING, FINISHING, AND CURING

- A. Operations: Utilize a standard type of air compressor, capable of providing a minimum of 250 cubic feet of air per minute per nozzle.
- B. Placing: Except when shooting reinforcing, hold the nozzle perpendicular to and 2-1/2 to 3 feet from surface. At reinforcing bars, hold the nozzle so as to direct shotcrete behind the bars, and shoot each side of each bars separately. A nozzleman's helper equipped with an air jet shall precede the nozzle and blow out rebound or sand lodged behind bars, on forms, or placed shotcrete. Placing shotcrete horizontal members from the top is not allowed unless approved methods are employed to eliminate all rebound. Material shall emerge from the nozzle in a uniform flow. If flow becomes intermittent for any reason, direct the nozzle away from the surface until the flow is again steady and constant. Do not reuse rebound or loose sand for any purpose.

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- C. Puddled Shotcrete: Use of “puddled shotcrete” in which the air pressure is reduced and the water content is increased to facilitate placing in difficult locations is not allowed. Do not place shotcrete where nozzle stream cannot impinge directly on the involved surface. Where difficult shooting conditions occur, obtain proper results by maintaining correct air pressure and water ratio and reduce supply of material.
- D. Construction Joints: Form joints with sloping beveled edges. Clean and dampen the hardened joint surfaces before placing additional shotcrete. Square edged construction joints are not allowed. The film of laitance which forms on the surface of the shotcrete shall be removed within approximately two hours after application by brushing with a stiff broom. If this film is not removed within two hours, it shall be removed by thorough wire brushing or sand blasting. Construction joints over eight hours old shall be thoroughly cleaned with air and water prior to receiving shotcrete.
- E. Finishing: Rod exposed surfaces to true planes and lines on reaching the thickness and plane established by forms and ground wires. Tamp and wood float surfaces level and provide a rough raked finish. Carefully coordinate finish requirements with other trades (ceramic tile, pool plaster) to ensure shotcrete finish is appropriate substrate for final finish material.
- F. Curing: Keep shotcrete continuously damp for not less than seven (7) days after placing. Use sealed curing sheeting or other approved curing method where water curing is not feasible. Do not use curing compound of any kind.

3.05 DEFECTIVE WORK

- A. Cut out, remove and replace, or repair to the satisfaction of the Owner’s Representative, shotcrete not meeting minimum strength, not true, plumb or level, not to required elevations, containing cracks detrimental to performance or appearance, containing shavings, debris or with honeycombs or voids.
- B. Promptly perform Work required to repair, patch, replace, render properly cleaned surfaces (by sandblasting if necessary) or otherwise make good any defective shotcrete at Contractor’s expense, including all expense of additional inspection, tests, or supervision made necessary as a result of defective shotcrete.

3.06 CLEAN-UP

- A. Upon completion of the Work of this Section, immediately remove all swimming pool shotcrete materials, debris and rubbish occasioned by this work to the approval of the Owner’s Representative.

END OF SECTION 13 11 03

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SECTION 13 11 04

SWIMMING POOL CERAMIC TILE

PART 1 – GENERAL

1.01 WORK INCLUDED

- A. Swimming pool ceramic tile detailed on the Drawings, including, but not limited to, the following:
 - 1. Waterline Face Tile
 - 2. Lane Line / Target Tile.
 - 3. Trim Tile (at 4'-6" depth and stairs)
 - 4. Depth / Caution Marker Tile (at waterline)
 - 5. Depth / Caution Marker on Deck.
 - 6. Pre Cast Coping

1.02 QUALITY ASSURANCE

- A. Qualifications of Workers:
 - 1. The entity performing the work of this Section shall have been successfully engaged in the respective trade for at least five (5) years immediately prior to commencement of the Work.
 - 2. For actual construction operations, use only trained and experienced workers with a minimum of three (3) years experience with the materials and methods specified.
 - 3. Provide at least one person who shall be present at all times during execution of the work of this Section, with a minimum of five (5) years experience with the type of materials being installed, the referenced standards, and who shall direct all Work performed under this Section.
- B. Standards: In addition to complying with all pertinent codes and regulations:
 - 1. Manufacture of all tile shall be in accordance with ANSI A-137.1.
 - 2. Install ceramic tile in accordance with the recommendations contained in the 2021 "Handbook for Ceramic Tile Installation" of the Tile Council of America, Inc.
- C. Tolerances: Install all swimming pool ceramic tile straight, true, plumb and square within a tolerance horizontally of one in 200 and a tolerance vertically of one in 500. Waterline and gutter bullnose tile shall be level to 1/8" (+/- 1/16") around entire perimeter of swimming pools.

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1.03 SUBMITTALS AND SUBSTITUTIONS

- A. Provide submittals in conformance with the requirements of Section 01 33 00. Requests for substitution shall conform to requirements of Article 1.10 of Section 13 11 00.
- B. Samples: Submit samples of each color and pattern in the specified groups. Character samples can be representative for review prior to screening of actual tile.
- C. Master Grade Certificate: Prior to opening ceramic tile containers, submit a Master Grade Certificate, signed by the manufacturer of the tile used and issued when the shipment is made, stating the grade, kind of tile, identification marks for the tile containers, and the name and location of the Project.
- D. Specifications: Submit manufacturer's recommended installation specifications for the Work.
- E. Submit proof of qualifications as specified in Article 1.02.A of this Section.

1.04 PRODUCT HANDLING

- A. Delivery: Deliver all materials to the Project Site in the manufacturer's original unopened containers with all labels intact and legible.
- B. Storage: Store all materials under cover in a manner to prevent damage and contamination, and store only the specified materials at the Project site.
- C. Protection: Use all means necessary to protect swimming pool ceramic tile before, during and after installation and to protect the installed Work specified in other Sections.
- D. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Owner's Representative.

PART 2 – PRODUCTS

2.01 TILE

- A. Waterline Face Tile:
 - 1. Material: All waterline face tile shall be glazed ceramic tile (Group III standard) as manufactured by Dal-Tile or approved equal.
 - 2. Size: 6 x 6 inches.
 - 3. Color: Dal-Tile #O-129, 'Sky Blue'. Contact Kylee Midura kylee.midura@daltile.com (858)344-0019.
- B. Lane Line / Target Tile:

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1. Material: Group 3 quality, frost proof unglazed ceramic mosaic tile with absorption rate of less than 1% as manufactured by Dal-Tile or approved equal.
 2. Size: 1 x 1 inches.
 3. Color: Dal-Tile #D311, 'Black'.
- C. Trim Tile (at stairs and at 4'-6" depth):
1. Material: Group 3 quality, frost proof unglazed ceramic mosaic tile with absorption rate of less than 1% as manufactured by Dal-Tile or approved equal.
 2. Size: Stairs: 1 x 1 inches, with S-812 quarter round.
 3. Color: Dal-Tile #D311 Black.'
- D. Depth / Caution Marker Tile (at waterline tile):
1. Material: Group 3 quality, frost proof unglazed ceramic mosaic tile with absorption rate of less than 1% as manufactured by Dal-Tile or approved equal.
 2. Size: 1 x 1 inches.
 3. Color: Dal-Tile #D-311, 'Black' letters and numbers on #D129, "Sky Blue".
- E. Depth / Caution Marker Tile on Deck
1. Group 3 quality, frost proof unglazed, non-slip ceramic tile with absorption rate of less than 1% as manufactured by Inlays or approved equal.
 2. 6 x 6 inches
 3. Ft. and In Series. White field, black letters and numbers
- F. Pre-Cast Coping:
1. Precast Coping: Han-Crete, Inc. or equal (909) 947-1543 to match existing profile, "Quick-Crete" or equal.

2.02 MORTAR

- A. Laticrete 3701 fortified mortar #LCR-37-1017.
- B. Site mortar mix shall comply with ASTM C270 standards.
 1. Sand for Mortar: Comply with requirements of fine aggregate for concrete.
 2. Cement: Type 1 portland cement, conforming to ASTM C150.
 3. Hydrated Lime: Conforming to ASTM C206 or 207, Type S.
 4. Water: From a potable source.

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- C. Water: From a potable source.
- D. Mortar shall meet ASTM C627

2.03 THIN SET MORTAR

- A. Laticrete 254 Platinum. Laticrete, Custom, or equal.
- B. Water from a potable source.
- C. Mortar shall meet ASTM C627.

2.04 GROUT

- A. All tile grout shall be waterproof grout complying with the recommendations of TCA and ANSI A118.6 (4) standards. Grout color shall be grey for dark backgrounds, white for light backgrounds (verify colors with Architect).

2.05 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation of ceramic tile as indicated on the Drawings, shall be new, first quality of their respective kinds, and subject to the approval of the Owner's Representative.

PART 3 – EXECUTION

3.01 SURFACE CONDITIONS

- A. Inspection:
 - 1. Prior to all Work of this Section, carefully inspect the installed Work of other trades and verify that all such Work is complete to the point where this installation may properly commence.
 - 2. Verify that ceramic tile can be installed in accordance with the original design and all referenced standards.
- B. Discrepancies:
 - 1. In the event of discrepancy, immediately notify the Owner's Representative.
 - 2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.
 - 3. Failure to notify the Owner's Representative and give written notice of discrepancies shall constitute acceptance by the Contractor of existing conditions as fit and proper to receive its Work.

3.02 INSTALLATION

- A. Method:

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1. Install all ceramic tile in strict accordance with installation method P601 of the 2021 Handbook for Ceramic Tile Installation of the Tile Council of America, Inc.
 2. Be certain to install all ceramic tile perfectly level, flush, plumb, and to the finish grades and elevations indicated on the Drawings.
- B. Interface:
1. Carefully establish and follow the required horizontal and vertical elevations to insure proper and adequate space for the work and materials of other trades.
 2. Coordinate and cooperate as required with other trades to insure proper and adequate interface of ceramic tile Work with the Work of other trades.
- 3.03 GROUTING
- A. Follow grout manufacturer's recommendations as to grouting procedures and precautions.
 - B. Remove all grout haze, observing grout manufacturer's recommendations as to use of acid and chemical cleaners.
- 3.04 EXTRA STOCK
- A. Provide one (1) unopened box of extra tile for 2.01A, 2.01B, 2.01C and 2.01F for Owners use at a future time.
- 3.05 CLEAN-UP
- A. Upon completion of the swimming pool ceramic tile installation, thoroughly clean and polish the exposed surfaces of tile work. Completely clean work area of debris and rubbish occasioned by this Work and dispose of to the approval of the Owner's Representative.

END OF SECTION 13 11 04

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SECTION 13 11 05

SWIMMING POOL PLASTER

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Swimming pool plaster and waterproofing of swimming pool structures as indicated on the Drawings and herein specified.
- B. Start-up and operation instructions to Owner's operations and maintenance personnel and properly balance swimming pool water chemistry until the Owner takes occupancy.

1.02 QUALITY ASSURANCE

- A. Qualifications of Workers:
 - 1. The entity performing the work of this Section shall have been successfully engaged in the respective trade for at least five (5) years immediately prior to commencement of the Work.
 - 2. For actual construction operations, use only trained and experienced workers with a minimum of three (3) years experience with the materials and methods specified.
 - 3. Provide at least one person who shall be present at all times during execution of the work of this Section, with a minimum of five (5) years experience with the type of materials being installed, the referenced standards, and who shall direct all Work performed under this Section.
- B. Standards: Swimming pool plaster shall conform with requirements of Chapter 31B of California Building Code, latest edition. In addition, meet requirements of applicable portions of most current edition of the "Technical Manual," National Plasterers Council, Wauconda, Illinois.
- C. Start-up:
 - 1. Furnish a swimming pool water chemistry consultant, with a minimum of five (5) years experience, possessing either AFO (Aquatic Facility Operator) or CPO (Certified Pool Operator) certification(s), to supervise and properly balance swimming pool water chemistry.
 - 2. Demonstrate to the Owner that all systems are fully operational and that calcium hardness, total alkalinity, chlorine residual and pH levels are within specified limits.

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3. Standards: Furnish labor and chemicals as required to condition the water properly to the following specifications:
 - (a) Calcium Hardness: 200-400 parts per million (PPM)
 - (b) Total Alkalinity: 80-100 PPM, minimum
 - (c) Chlorine Residual: 1.00 to 2.00 PPM
 - (d) pH Factor: 7.2 to 7.6

1.03 SUBMITTALS AND SUBSTITUTIONS

- A. Provide submittals in conformance with the requirements of Section 01 33 00. Requests for substitution shall conform with requirements of Article 1.10 of Section 13 11 00.
- B. Submit proof of qualifications as specified in Article 1.02 and 1.02.C.1 of this Section.

1.04 PRODUCT HANDLING

- A. Delivery: Deliver materials to the Project Site in the manufacturer's original unopened containers with all labels intact and legible.
- B. Storage: Store materials under cover in a manner to prevent damage and contamination, and store only the specified materials at the Project Site.
- C. Protection: Use all means necessary to protect the swimming pool plaster before, during, and after installation and to protect the installed Work specified in other Sections.
- D. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Owner.

1.05 ENVIRONMENTAL CONDITIONS

- A. No plastering shall be done under unsuitable conditions of weather or temperature. No plastering shall be done when prevailing temperature is 40 degrees Fahrenheit or less.
- B. Do not install plaster during rain and, if rain commences after plastering has begun, immediately protect the plaster from rain by all means necessary until the plaster has set.
- C. Do not install plaster during wind greater than 10 mph and, if wind commences after plastering has begun, immediately protect the plaster from wind by all means necessary until the plaster has set.

PART 2 PRODUCTS

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2.01 CEMENT / AGGREGATE

- A. Luna Quartz® tiny pebble finish by Wet Edge Technologies. Altima® quartz finish by Wet Edge Technologies. Pebble-Fina® pool finish by Pebble Technologies.

2.02 COLOR

- A. All swimming pool plaster shall be white in color. Wet Edge Technologies shall be Luna Quartz® “Polar White”. Wet Edge Technologies shall be Altima® “White”. Pebble Technology shall be Pebble-Fina® “Classico”. Contractor to obtain written approval on selected pebble color from the local Health Department prior to installation. Submit cut sheet, color sample and written approval for review by Architect and Owner

2.03 WATER

- A. Water for swimming pool plaster shall be clean and free from injurious amounts of acid, alkali, and organics.

2.04 PUMP PIT & BACKWASH PIT WATERPROOFING

- A. Xypex, Miracote Miraflex Membrane C, or approved equal. Mix and apply per manufacturer’s recommendations for specific application. Color shall be Gray.

PART 3 EXECUTION

3.01 SURFACE CONDITIONS

- A. Inspection:
 - 1. Prior to Work of this Section, carefully inspect the installed Work of other trades and verify that all such Work is complete to the point where this installation can properly commence.
 - 2. Verify that swimming pool plaster can be installed in accordance with the original design and all referenced standards, including proprietary application techniques and application training/certifications.
- B. Discrepancies:
 - 1. In the event of discrepancy, immediately notify the Owner's Representative.
 - 2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

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3. Failure to notify the Owner's Representative and give written notice of discrepancies shall constitute acceptance by the Contractor of existing conditions as fit and proper to receive the Work.

3.02 INSTALLATION OF PUMP PIT & BACKWASH PIT WATERPROOFING

- A. Provide two (2) coats of the specified gutter and surge chamber waterproofing prior to plastering the swimming pool. Prepare surfaces to receive waterproofing and cure in conformance with manufacturer's recommendations. Provide steel trowel application method to ensure uniform smooth, dense surface finish.

3.03 INSTALLATION OF POOL PLASTER

- A. Outdoor Pools or Spas:
 1. Completion of other work: DO NOT commence plastering of swimming pool(s) or spa(s) until the following conditions have been met:
 - (a) The Health Department and/or other governing agencies have approved the pool(s) and/or spas) for plaster.
 - (b) All concrete pool deck construction is complete and the pool decks have been thoroughly cleaned.
 - (c) All landscaping in areas adjacent to the pool(s) or spa(s) is complete and the landscape irrigation system is operable.
 - (d) All painting in the pool area is complete.
 - (e) All welding and grinding in locations adjacent to the pool area are complete.
 - (f) The backwash sewer connection is complete.
 - (g) Pool(s) and/or spa(s) area(s) perimeter fencing installation is complete.
 - (h) All trash and debris have been removed from areas adjacent to the pool(s) or spa(s), particularly those areas that are normally upwind from the pool(s) or spa(s).
 - (i) All dust raising construction and/or activities in areas adjacent to the pool(s) or spa(s) are complete or mitigated.
 - (j) The circulation pump(s) is/are operational.
 - (k) The mechanical system has been flushed sufficiently to remove all dirt and debris from the piping system.

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- (l) All necessary chemicals (Chlorine, pH adjuster, Sodium Bicarbonate and Calcium Chloride or any other required chemicals) are on site and ready for use.
- (m) Obtain written approval from the Owner and the Architect.

B. Indoor Pools or Spas:

1. Completion of Other Work: DO NOT commence plastering of swimming pool(s) or spa(s) until the following conditions have been met:

- (a) The Health Department has approved the pool(s) and/or spa(s) for plaster.
- (b) All work above the pool(s) and/or spa(s) is complete.
- (c) All painting in the pool area is complete.
- (d) All welding and grinding in locations adjacent to the pool area are complete.
- (e) The backwash sewer connection is complete.
- (f) All concrete pool deck construction is complete and the pool decks have been thoroughly cleaned.
- (g) The circulation pump(s) is/are operation.
- (h) The mechanical system has been flushed sufficiently to remove all dirt and debris from the piping system.
- (i) All necessary chemicals (Chlorine, Acid, Sodium Bicarbonate and Calcium Chloride) are on site and ready to use.
- (j) Obtain written approval from the Owner and the Architect.

C. Contractor accepts all liability from damage done to the pool plaster if the pool(s) or spa(s) is (are) plaster before the completion of the above listed items or without the written approval of the Owner and the Architect.

D. POOL PLASTER AUTHORIZATION FORM:

1. The pool(s) and or spa(s) at McKinley Park is/are hereby approved for the installation of the pool plaster. Pursuant to the requirements of specification section 131105, paragraph 3.03.

Owner

Date

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Architect / Project Manager

Date

E. Preparation:

1. Do not apply plaster over dirt, rust, scale, grease, moisture, scuffed surfaces or conditions otherwise detrimental to the formation of a durable plaster finish.
2. Consult with manufacturer on application to specific surfaces being treated. Follow manufacturer's recommendation for curing of cast-in-place concrete or shotcrete surfaces prior to application of plaster.
3. Protect ceramic tile, decking, deck equipment, gratings, fittings and other items by suitable covering or masking.
4. Mask or remove all hardware, hardware accessories, machined surfaces, plates, lighting fixtures and similar items in place not to receive pool plaster. Following completion of plaster for each space or area remove masking. Re-install all removed items utilizing workers skilled in the trades involved.

F. Application:

1. Finish shall be applied to a uniform thickness of 3/8" to 1/2" over the entire surface. The walls shall be scratch-coated followed by a finish coat. Material applied to the floor after the walls have been applied shall be accelerated to assure uniform setting time throughout the pool surface.
2. Float the plaster to a uniform plane and trowel to a smooth, dense, impervious surface using extreme care to avoid stains.

END OF SECTION 13 11 05

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SECTION 13 11 06

SWIMMING POOL EQUIPMENT

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Swimming pool equipment items required for this Work as indicated on the Drawings and specified herein.

1.02 QUALITY ASSURANCE

- A. Qualifications of Workers:
 - 1. The entity performing the work of this Section shall have been successfully engaged in the respective trade for at least five (5) years immediately prior to commencement of the Work.
 - 2. For actual construction operations, use only trained and experienced workers with a minimum of three (3) years experience with the materials and methods specified.
 - 3. Provide at least one person who shall be present at all times during execution of the work of this Section, with a minimum of five (5) years experience with the type of materials being installed, the referenced standards, and who shall direct all Work performed under this Section.

- B. All equipment supplied or work performed shall comply with regulations governing public swimming pools and spas as contained within Chapter 31 of California Building Code, latest edition.

1.03 SUBMITTALS AND SUBSTITUTIONS

- A. Provide submittals in conformance with the requirements of Section 01 33 00. Requests for substitution shall conform with requirements of Article 1.10 of Section 13 11 00.
- B. Required submittals include:
 - 1. Swimming Pool Safety Equipment and Maintenance Equipment as specified in Article 2.01 and 2.02 of this Section.
 - 2. Swimming Pool Fittings, Deck and Mechanical Equipment as

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specified in Article 2.03-2.16 of this Section.

- C. Submit proof of qualifications as specified in Article 1.02.A of this Section.
- D. The equipment shown on the plans represent the first listed items in the technical specifications. The Contractor shall be responsible for all required field coordination and installation of any approved equal product to provide a fully working and warranted system. The Contractor shall submit detailed shop drawings for any products used other than the first listed specified items. Contractor provided shop drawings shall include details and quality equal to the original plans and construction documents. The Contractor shall provide any and all required engineering including but not limited to structural and anchorage requirements for any proposed equipment other than the first listed specified equipment. The Contractor is responsible to provide a factory certified representative(s) to start-up and provide on-site training for all swimming pool mechanical equipment provided.

1.04 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect swimming pool equipment items before, during and after installation and to protect the installed work specified in other Sections.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Owner's Representative.

PART 2 PRODUCTS

2.01 SAFETY EQUIPMENT

- A. First Aid Kit for 50 Persons with two (2) wool blankets: Marine Rescue or approved equal. Quantity as required by the Department of Health, one (1) minimum.
- B. Rescue Tubes (minimum 49" long) and Life Ring Buoy (minimum 24" in diameter) U.S. Coast Guard Approved: Marine Rescue or approved equal. Quantity as required by the Department of Health, one (1) minimum.
- C. Throw Rope (3/16" diameter) complete with lemon foot, for use with Life Ring Buoy: Kiefer, United Industries, or approved equal. Quantity as required by the Department of Health, one (1) minimum.

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- D. Rescue Hooks, 16' long x 1-1/2" aluminum pole and stainless-steel mounting hardware: Kiefer, Pentair, or approved equal. Quantity as required by the Department of Health, one (1) minimum.
- E. Pool Safety Signs: As required by the Department of Health. Submittal required. Placement at the pool site shall be in conformance with Health Department Inspector. One (1) set minimum.

2.02 MAINTENANCE EQUIPMENT

- A. Commercial Pool Vacuum: Provide pool vacuum cart with lid-mounted handle, separate lid-mounted bracket for electrical cord, and two rubber-tired ball bearing wheels with grease fittings. Cart and filter shall be fabricated from schedule 304 stainless steel with welds treated and passified. Provide an all-bronze pump with a 1 1/2 hp, 115/230 volt, maximum 20 amp draw @ 120 volts, single phase motor and a 6" bronze trap. Pump shall be UL and NSF listed, have 2" suction and 1 1/2" discharge fittings, and have a brass priming valve with hose bib. Entire pump assembly shall be anchored to vacuum cart with two stainless steel bolts. Provide a 100 foot 10 AWG 3/C SJ electrical cord with ground fault interrupter (GFI) plus. Cord shall be wired to a double pole, 30-amp switch which shall be mounted on pump motor. One (1) required.
- B. Heavy Duty Vacuum Hose: 2" x 50', with hose connector. Pentair, Smooth Bore or approved equal. One (1) required.
- C. Utility Pole: 24' fiberglass with connectors. Pentair, Skimlite or approved equal. One (1) required.
- D. Commercial Vacuum Head: 24" wide "flexible" vacuum head. Pentair Model #R201186, or approved equal. One (1) required.
- E. Pool Wall Brush: 36" wide professional quality. Pentair or approved equal. One (1) required.
- F. Leaf Skimmer: 30" x 8" x 12", professional quality. Pentair, Spectrum or approved equal. One (1) required.
- G. Water Quality Test Kit, Professional Grade, Taylor Technologies Model #1741C, LaMotte Model #PRO250-NJ, or approved equal. One (1) required.

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2.03 FITTINGS

- A. Main Drain Frame & Grate (18" x 18"): Lawson Aquatics #MLD-FG-1818, or approved equal, two (2) required. Lawson Aquatics or equal. Contractor shall provide to the Owner a Certificate of Compliance, signed by a licensed design professional, for main drain sump(s) and frame(s) and grate(s), as required by the Virginia Graeme Baker Act.

2.04 DECK EQUIPMENT

- A. Handrail: KDI Paragon 48" custom, 3 bend, 1.90" O.D. x 0.65" wall. Four (4) required.
- B. Anchor Sockets for Handrails: Spectrum #24010, KDI-Paragon 28102, or approved equal. Eight (8) required.
- C. Stainless Steel Escutcheon Plates for Handrails: Spectrum Model #35214, no known equal. Eight (8) required.
- D. Disabled Lift: Aqua Creek MTY-400 self-operated or approved equal. Furnish complete with anchors, cover, extra battery pack and transporter cart. All parts and accessories shall be Coastal Gray. One (1) required.

2.05 SWIMMING POOL STRAINER

- A. 'MerMade' F.O. series FRP reducing basket strainer: One (1) 6" x 5" standard, with acrylic lid and two (2) stainless steel strainers each (150 lbs.)

2.06 SWIMMING POOL CIRCULATION PUMP

- A. 'Paco' #4095-7; 4" x 5" x 8.34" Type 'LC' end suction centrifugal pump; 1760 RPM 208V, 3PH; 15HP; rated at 490 GPM @ 60 Ft. TDH; 79.64% efficient; premium efficiency TEFC motor; epoxy coat all wet surfaces. 'Paco', 'Aurora' or equal. (760 lbs.) Provide 'SPCS' EKO-FLEX pump control system variable speed drive model SPCS015EF4 system 20.5" x 41" x 13.9" deep. Coordinate mounting location to maintain required clearances, 208V 3PH. (126 lbs.)

2.07 SWIMMING POOL FILTERS

- A. 'Eko3' EKO-42175-0606-T-2 fully automatic hi-rate permanent media filter with 35 sq. ft of filter area rated at 525 GPM at 15 GPM /sq. ft.. Complete

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with 6" face piping, 6" backwash, seismic anchorage. Provide all utilities, piping, valving, etc. (6085 lbs. each tank) EKO Systems Gen 2, 'Stark' or equal. Provide Signet MK-515 flosensor with digital readout. One (1) system total.

2.09 CHLORINE FEED SYSTEM

- A. Provide 'Chem-Tainer' 500 Gallon #TC5971TC dual storage/containment tank with lid seismically restrained; (4,165 lbs.). Complies with Fed. Reg. #40CFR-264-193. Feed pump shall be 'LMI' #SD43-88P-KSI, 288 GPD @ 15 PSI with FRP shelf brackets. Hard pipe to point of injection.

2.10 ACID STORAGE/FEED SYSTEM

- A. Provide 'Chem-Tainer' 350 Gallon #TC5256DC; dual storage/containment tank with lid seismically restrained; Operating Weight = (2915 lbs). Complies with Fed. Reg. #40CFR-264-193. Provide 60 gallon acid vapor recovery system. One (1) total. Provide one (1) Stenner #45MHP10, 10 GPD at 100 PSI.

2.11 SWIMMING POOL WATER CHEMISTRY CONTROLLER

- A. Provide Ethernet connection to swimming pool: 'BecSys' CS-BECSYS7-BP-E water chemistry controller. Provide complete system control package 'BecSys System 7', 'BecSys System 5', 'Impact', 'Wallace & Tiernan' or approved equal.

2.12 ELECTRICAL

- A. Provide all electrical wiring, conduit, panel(s), starter/disconnect interconnects etc, as required for proper equipment installation per manufacturer's recommendations and shop drawings. Coordinate all work with other trades as required. Refer to electrical plans for all additional info.

2.13 PUMP PIT

- A. 6'-0" x 8'-0"x5'-0" deep. Provide 2" ø galv. standard steel pipe guardrail. Provide sump pump in sump with ejection into raised backwash pit. Provide waterproofing per section 13 11 05. Access ladder to be 'Fibergate' Dynarail FRP or equal.

2.14 BACKWASH PIT

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- A. 5'-4" x 8'-0"x5'-0" deep with 8" ø P-trap outlet to sewer. Provide water proofing per section 13 11 05. Coordinate with structural and plumbing plans.

2.15 FILL SYSTEM

- A. Niche mounted PEM L104-46 sensor in wall mounted box #463-0700 with PEM L104-100 controller, or approved equal. Swimming pool = ¾", one (1) total.

2.16 EYEWASH / SHOWER

- A. Haws model #8300-8300 CRP combination eyewash / shower, with corrosion resistant protection. Two (2) required. See MEP sheets for water supply piping.

PART 3 EXECUTION

3.01 SURFACE CONDITIONS

A. Inspection:

1. Prior to installing the items of this Section, carefully inspect the installed Work of other trades and verify that all such Work is complete to the point where this installation may properly commence.
2. Verify that the swimming pool equipment items may be installed in strict accordance with original design, pertinent codes and regulations, and the manufacturers' recommendations.

B. Discrepancies:

1. In the event of discrepancy, immediately notify the Owner's Representative.
2. Do not proceed with installation in areas of discrepancy until all such discrepancies are fully resolved.
3. Failure to notify the Owner's Representative and give written notice of discrepancies shall constitute acceptance by the Installer of existing conditions as fit and proper to receive its Work.

3.02 INSTALLATION

- A. Supply and install items of swimming pool equipment in strict accordance

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with applicable codes and regulations, the original design, and the manufacturer's published recommendations, anchoring firmly and securely for long life under hard use.

- B. Coordinate with other trades to insure all imbedded items are set plumb and flush. Railing ends must have anchor sockets and escutcheon plates. Be certain that deck equipment and railings are properly bonded prior to imbedding.
- C. All equipment shall be braced and/or anchored to resist a horizontal force acting in any direction using the criteria shown on the Drawings.

3.03 INSTRUCTION

- A. The Contractor shall provide a factory certified representative(s) to start-up and certify proper installation, operation and full warranty status of all swimming pool mechanical equipment. The Contractor shall provide not less than two 8-hour days of on-site training for facility staff in the operation and maintenance of the swimming pool mechanical equipment and systems. The two 8-hour days shall be separated by a minimum of seven calendar days and be completed within the 14-day start-up period.

3.04 EQUIPMENT ACTIVATION

- A. All water chemistry and filtration mechanical equipment shall be operational upon filling of pool after plaster. Chemicals and other related support items as supplied by Contractor, shall be in supply at start-up.
- B. For the first fourteen (14) calendar days after completion of the pool plaster, brush all plastered surfaces at least twice a day and coordinate with General Contractor to ensure that the plaster is carefully maintained after the initial fourteen-day period. In addition, coordinate with the Contractor to ensure that pool filtration equipment is continuously running during the initial fourteen-day period.
- C. Start-up and provide qualified personnel to operate pool equipment for a period not less than fourteen (14) days after the pool is placed in operation, or until the Owner takes occupancy of the facility or letter of substantial completion. During this time, Contractor shall instruct and supervise the Owner's personnel in the various operating and maintenance techniques involved. Contractor shall be responsible for supply of chemicals during this not less than fourteen (14) day period and at time of turnover to Owner, chemical storage tanks shall be full.

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(Owner's personnel shall be fully trained and capable of assuming swimming pool maintenance tasks, training may begin before Owner takes occupancy).

3.5 CLEAN-UP

- A. Upon completion of swimming pool equipment, remove all debris, materials and equipment occasioned by this Work to the approval of the Owner's Representative.

END OF SECTION 13 11 06

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SECTION 13 11 07

SWIMMING POOL MECHANICAL

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Swimming pool mechanical piping as indicated on the Drawings for circulation and filtration systems, pool water heating systems, chemical control systems, booster pump systems and appurtenances.
- B. Domestic water system from points of connection within swimming pool mechanical equipment room to make-up water system.
- C. Filter backwash piping to point of connection with backwash retention pit as required.

1.02 QUALITY ASSURANCE

- A. Qualifications of Workers:
 - 1. The entity performing the work of this Section shall have been successfully engaged in the respective trade for at least five (5) years immediately prior to commencement of the Work.
 - 2. For actual construction operations, use only trained and experienced workers with a minimum of three (3) years experience with the materials and methods specified.
 - 3. Provide at least one person who shall be present at all times during execution of the work of this Section, with a minimum of five (5) years experience with the type of materials being installed, the referenced standards, and who shall direct all Work performed under this Section.
- B. Standards:
 - 1. All equipment supplied or work performed shall comply with Chapter 31B of California Building Code, latest edition.
 - 2. Work shall be performed in accordance with the applicable editions of all National, State and local codes, laws, regulations and ordinances, including the following:
 - (a) American National Standards Institute (ANSI).
 - (b) American Society for Testing Materials (ASTM).
 - (c) American Waterworks Association (AWWA).
 - (d) American Welding Society (AWS).

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3. Do not construe anything in the Drawings or Specifications to permit Work not conforming to these requirements.

1.03 SUBMITTALS AND SUBSTITUTIONS

- A. Provide submittals in conformance with the requirements of Section 01 33 00.
- B. Required submittals include:
 1. Pipe and Fittings as specified in Article 2.02 of this Section.
 2. Valves as specified in Article 2.03 of this Section.
 3. Pressure / Vacuum Gauges as specified in Article 2.04 of this Section.
 4. Pipe Hangers and Supports as specified in Article 2.05 of this Section.
 5. Sleeves and Waterstops as specified in Article 2.06 of this Section.
- C. Submit proof of qualifications as specified in Article 1.02.A of this Section.

1.04 PRODUCT HANDLING

- A. Delivery: Deliver all materials to the Project Site in the manufacturer's original unopened containers with all labels intact and legible.
- B. Storage: Store all materials under cover in a manner to prevent damage and contamination, and store only the specified materials at the Project site.
- C. Protection: Use all means necessary to protect swimming pool mechanical items before, during and after installation and to protect the installed Work specified in other Sections.
- D. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Owner's Representative and at no additional cost to the Owner.

1.05 JOB CONDITIONS

- A. Cooperate with entities performing Work specified in other Sections to so that no conflict of new construction or occupied space may occur. Should any installation Work be done without such craft coordination, that Work so installed shall be removed and re-installed.

PART 2 - PRODUCTS

2.01 PRODUCT QUALITY

- A. Materials and equipment shall be new, of the best quality for the purpose intended, and shall be clearly marked with the manufacturer's name and

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nameplate data or stamp and rating. As far as practicable, materials and equipment shall be of one manufacturer.

2.02 PIPE AND FITTINGS

- A. PVC Schedule 40: Type 1, normal impact, NSF approved for solvent welding applications, ASTM Specification D-1785, color shall be white. Dura, Lasco, or approved equal.
- B. PVC Schedule 80: Type 1, normal impact, NSF approved for solvent welding applications, ASTM Specification D-1785, color shall be gray. Dura, Lasco, or approved equal.
- C. CPC Schedule 80 for Influent/Effluent Heater Piping: Type 1, normal impact, NSF approved for solvent welding applications, ASTM Specification D-1785, color shall be gray. Dura, Lasco, or approved equal.
- D. PVC DR25: Conforming to ATSM D-1784, use with epoxy coated bell and spigot-type fittings or epoxy coated mechanical joint by flange adapters with epoxy coated cast iron fittings as specified in Article 2.2 (F), below. Johns-Manville "Big Blue", Diamond Plastics, or approved equal.
- E. Copper Tubing: ASTM Specification B-88, hard drawn, with ANSI Standard B16.22 wrought copper fittings.
- F. Steel: ASTM Specification A-120, Schedule 40 black or galvanized pipe with ASTM A-47 150 lb. banded malleable iron threaded fittings.
- G. Cast Iron: ASTM Specification B16.1, cast iron flanged fittings, provide epoxy coating as required for use with chlorinated water.

2.03 VALVES

A. Ball Valves:

- 1. For pool system: True-Union design, PTFE seat material with FPM or FKM Double O-ring stem seals, locking handle, NSF certified. PVC schedule 80 body for below grade installation. CPVC Schedule 80 body for above grade installation. Furnish ball valves on all pipe diameters 2½" or less with a rating of at least 200psi at 73°F. Asahi, Ipex, or Nibco.
- 2. For copper pipe system: 3-piece full-port Bronze body valve with Teflon seat, 'Apollo', 'Nibco' or approved equal.

B. Butterfly Valves:

- 1. Epoxy coated cast or ductile iron body, 316 stainless steel disc and stem, viton seat material, furnish hand wheel/gear operators on all valves 8" and larger. DeZurick, Keystone, Ipex or equal.

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2. PVC body, PVC disc and EPDM construction suitable for chlorinated water applications. Stem shall be of 316 stainless steel and non-wetted. Valves shall be self-gasketed design with a convex sealing arrangement. Valves 1-1/2" – 10" shall be rated to 150 psi and 12" valves shall be rated to 100 psi at 70°F. Asahi Pool-Pro, no known equal.
- C. Check Valves: Wafer-type, epoxy coated cast or ductile iron body, 316 stainless steel plates and shaft, viton seat material. Centerline, Metraflex, or approved equal.
- D. Surge Chamber Float Valve: EPD #2-0020-231 Float Control Valve, 12"-line size, as manufactured by Environmental Products Division of Doughboy Recreational, Rancho Cucamonga, CA, no known equal.
- E. Surge Chamber Isolation Valve: Butterfly valve, tapped lug style, bronze body, stainless steel stem, bronze disc, phenolic back-up ring, EPT seat material. Provide stainless steel shaft extension, shaft housing and tool operator located 2'-0" above floor level with deck access grate as required. DeZurick, Keystone, Asahi, Spears, Ipex or approved equal.
- F. RP Backflow Preventer: Febco #835-B for 2" and smaller; #825 for 2-1/2" and larger. Febco, Watts, or approved equal.
- G. Make-up Water Control: 3" 'Cla-Val' fill system to include 3" 'Cla-Val' solenoid control valve #136-01BY, 3" ductile iron, epoxy coated body with cast iron disc retainer and diaphragm washer, bronze trim, flanged globe pattern, 120V at 60 Hz. Solenoid wiring shall be wired to water chemistry controller. Provide 6" air gap at fill point.

2.04 PRESSURE / VACUUM GAUGES

- A. Furnish and install pressure and vacuum gauges on the discharge and suction sides of all pumps. 2" or 2 1/2" dial, bottom connection, chrome ring, shut-off cock and snubber. Ranges shall be selected to indicate between mid-point and two-thirds of maximum range under design conditions. Marsh, Trecice, or approved equal.

2.05 PIPE HANGERS AND SUPPORTS

- A. General:
 1. The requirements of this Section relates to various requirements of the Agreement, General and Supplementary Conditions, Specifications, Drawings, and modifying documents which are part of the Construction Contract. Responsibility for coordination of all such applicable requirements will be that of the Contractor.
- B. Description:

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1. This section provides guidelines and limitations for the support of all mechanical, electrical, plumbing or architectural items from the building structure, and for the seismic bracing of such items.
 2. Design and install all support and bracing systems as required for the swimming pool systems. Provide for attachment to portions of the building structure capable of bearing the loads imposed. Design these systems to not overstress the building structure.
- C. Quality Assurance:
1. Design and install all support systems to comply with the requirements of the 2019 California Building Code, Chapter 16A.
 2. Seismic bracing is to be designed by a professional engineer licensed in the State of California.
 3. For the seismic bracing of mechanical, electrical and plumbing system, refer to “Guidelines for Seismic Restraints of Mechanical Systems and Plumbing Piping Systems” by Sheet Metal and Air Conditioning Contractors National Association, Inc., (SMACNA) for guidelines.
- D. Submittals:
1. Submit shop drawings for all substructures and attachment methods.
 2. Submit proposed alternative methods of attachment for review and approval by the Architects, prior to deviating from the requirements given below.
 3. For all pipe hangers and support systems, submit structural calculations and details which include all resultant forces applied to the building structure and are prepared and signed by the Contractor’s licensed California professional engineer. Calculations will be reviewed for compliance with design criteria, not for arithmetic.
- E. Materials:
1. Use Kin-Line, Grinnel, or approved equal.
 2. Support all pipelines individually with hangers, each branch having at least one hanger. Lateral brace as noted and required.
 3. Support piping near floor with steel stanchions welded to end plates secured to pipe and floor.
 4. Support vertical piping at each floor level. Install coupling in piping at each support. Coupling shall rest on and transmit load to support. Isolate copper from steel supports with vinyl electrician's tape around pipe and coupling.

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5. Use Stoneman "Trisolator," Unistrut, or approved equal, isolators at each hanger and other support points on bare copper tubing system.
 6. For PVC pipe, space hangers four (4) feet apart for pipe sizes 1" and under, five (5) feet apart for pipe sizes 1-1/4" to 2", and six (6) feet apart for pipe sizes over 2". Space hangers for horizontal pipes at a maximum of six (6) feet for copper 2" and smaller and for steel 1-1/4" and smaller; ten (10) feet for copper 2-1/2" and larger and for steel 1-1/2" and larger.
 7. Size hanger rods, screws, bolts, nuts, etc., according to manufacturer's sizing charts.
 8. Trapeze hangers may be used for parallel lines.
 9. Use galvanized or cadmium plated hangers, attachments, rods, nuts, bolts, and other accessories in pool mechanical room, high humidity areas, or where exposed to weather. Hot dip galvanize all items which are not factory furnished. Plating for hinged movements must be done at the factory.
 10. Lateral Bracing: To prevent swaying of the piping systems, provide angle iron bracing and anchor into wall or overhead framing. Piping shall be braced or anchored in such a way as to resist a horizontal force of 50% of its operating weight in any direction.
 11. Do not use wire or other makeshift devices for hangers.
 12. Furnish all substructures and fasteners required to comply with the limitations given below. Use material as specified in the various sections and as appropriate to their use.
- F. Guidelines & Limitations:
1. Each Contractor will coordinate the load requirements from all subcontractors so that no combination of loads overstresses the building structure or exceed the limitations given below.
 2. Concrete Structure:
 - (a) Support all loads hung from concrete structure with cast-in-place inserts, unless drilled-in anchors are specifically approved in writing prior to placing the concrete.
 - (b) Concrete anchors must not penetrate into reinforcing bars. Where the anchors boring indicates the presence of reinforcing bar, patch hole with an epoxy type grout and relocate anchor 12 diameters away.

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- (c) Individual expansion anchors cannot support any loads greater than 300 pounds or manufacturer's specified load capacity without approval.
- 3. Steel Structure:
 - (a) Hang no more than 20 pounds per metal deck rib in any span.
 - (b) At beams, hang all beam loads greater than 40 pounds concentric to beam, not off the flanges.
 - (c) Attached no loads to the beams or girders greater than the following without specific approval from the architect;
 - 1) Roof beams and girders: 300-pound point load or 600-pound total load for a single span.
- G. Seismic Bracing:
 - 1. Design and install seismic bracing to not ground out vibration and sound isolation systems.
 - 2. All items of mechanical and electrical equipment 60" or more in height are to be seismically braced whether such bracing is shown or not.

2.06 SLEEVES AND WATERSTOPS

- A. Provide sleeves where work of this Section passes through fire rated partitions, floors and ceilings, concrete slabs or exterior of structure. Caulk clearance space using sealant appropriate for application in conformance with manufacturer's recommendations and Title 24 of California Code of Regulations. 3m, Dow Corning, or approved equal. In lieu of sleeves and caulking, "Link Seal" products may be used.
- B. Provide prefabricated waterstops as indicated on the Drawings at all pipe penetrations through structures containing stored water (i.e., swimming pools, balance/surge tanks, etc.) to insure leak-proof seals.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

- A. Inspection:
 - 1. Prior to Work of this Section, carefully inspect the installed Work of other trades and verify that such work is complete to the point where this installation may properly commence.
 - 2. Verify that items of this Section may be installed in accordance with the original design and referenced standards.

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- B. Discrepancies:
1. In the event of discrepancy, immediately notify the Owner's Representative.
 2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.
 3. Failure to notify the Owner's Representative and give written notice of discrepancies shall constitute acceptance by the Contractor of existing conditions as fit and proper to receive his work.

3.02 ABBREVIATIONS AND SYMBOLS

- A. Abbreviations and symbols on the Drawings are those most commonly used. Obtain clarification from the Owner's Representative on any questionable items before bid.

3.03 GENERAL PIPING REQUIREMENTS

- A. Size any section of pipe for which size is not indicated or any intermediate section erroneously shown undersized the same size as the largest pipe connecting to it. Sizes listed are nominal.
- B. Cut pipe accurately to job measurements and install without springing or forcing, true to line and grade, generally square with building and/or structures and adequately supported to prevent undue stress on pipe, fittings and accessories.
- C. Make changes of direction with manufactured fittings. Street ells, bushings, reducing flanges, close nipples or bending of pipe is not allowed.
- D. Use great care to install piping in accordance with best practice. Plastic pipe shall be "snaked" in trenches to allow for thermal expansion.
- E. All above grade, below grade and buried or imbedded PVC shall be installed using solvent weld fittings. Also, each and every fitting and pipe end shall be prepared with solvent primer. Fittings shall be joined individually and with enough time between assembly of adjacent joints to allow them to seal solidly. After joining, an even ring of primer must be visible around the entire fitting. If any fittings are installed without visible primer, the fitting shall be removed and discarded and piping recut, rechamfered and joint made up again using a new fitting. All procedures, methods and techniques used to make up solvent weld joints shall be in strict accordance with manufacturer's recommendations.
- F. Arrange pipe and hangers to allow for expansion, contraction and structural settlement. No pipe shall contact structure except penetrations as shown on the Drawings.
- G. Provide dielectric connections between copper and dissimilar metals. In

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copper systems, threaded piping including connections to equipment shall be brass pipe and fittings. Install dielectric connections in vertical sections of piping only.

- H. Run pipe full size through shut-off valves, balancing valves, etc. Change pipe size within three (3) pipe diameters of final connection to control valves, fixtures and other equipment.
- I. Provide unions or flanges at connections to equipment, on service side of valves and elsewhere as required to facilitate ease of maintenance.
- J. Locate equipment shut-off valves as close to equipment as possible maintaining easy valve access.
- K. Make all connections between domestic water systems and equipment or face piping with approved backflow prevention devices as required.
- L. All PVC pipe exposed to direct sunlight shall be painted with two coats of Exterior Acrylic Semi-Gloss Paint, Sherwin Williams or equal. Color to be selected by the Architect. Prior to painting the PVC pipes, the exterior of all PVC pipes shall be wiped with Methyl Ethyl Ketone, or an approved equal, to remove the glaze from the pipes.
- M. The Main Drain pipe must run either level or uphill from the main drain sump, through the surge pit (if applicable) and then to the circulation pump.

3.04 TRENCH EXCAVATION AND BACKFILL

- A. Excavation:
 - 1. Excavate and backfill trenches as required for the Work of this Section. Conform to requirements of Section 13 11 01.
 - 2. The Contractor shall perform all excavation of every description and of whatever materials encountered, to the depths indicated on the Drawings or as necessary. The Contractor shall dispose of the excavated materials not required or suitable for backfill as directed, and shall perform such grading as may be necessary to prevent surface water from flowing into the trenches. The Contractor shall provide adequate equipment for the removal of storm or subsurface waters, which may accumulate in the excavated areas.
- B. Trenching:
 - 1. Excavate trenches to lines and grades as indicated on the Drawings and with banks as nearly vertical as practicable.
 - 2. Bottoms of trenches shall be accurately graded to provide uniform bearing on undisturbed soil for the entire length of each section of pipe.

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3. The width of the trench at and below the top of the pipe shall be such that the clear space between the barrel of the pipe and the trench wall shall not exceed 8" on either side of the pipe. The width of trench above the top of pipe may be wider if necessary.
 4. Over-depth excavations shall be filled with tamped sand to required grades.
 5. Excavations of five (5) feet or more in depth shall be shored or supported in conformance with rules, and regulations of State and Federal Governments. Shoring shall be constructed, maintained and removed in a manner to prevent caving of the excavation walls or other load on the pipe.
- C. Backfilling:
1. Material for backfilling of pipes shall be approved granular material less than two (2) inches in diameter obtained from the excavation. No material of a perishable, spongy or otherwise unsuitable nature shall be used as backfill.
 2. Backfilling of pipe trenches shall commence immediately after installation and testing to preclude damage to the installed pipe. Backfill around pipe shall be carefully placed so as not to displace or damage the pipe, and shall be carried up symmetrically on each side of the pipe to one foot above the top of the pipe. The material shall be carefully compacted or consolidated before additional backfill is placed.
 3. Backfill above an elevation of one foot above the top of pipe in conformance with requirements of Section 13 11 01. Material for balance of backfill shall be approved granular material less than six (6) inches in diameter taken from the excavation.
 4. Unless otherwise indicated on the Drawings, all pipe shall have a minimum of eighteen (18) inches of cover.

3.05 GENERAL EQUIPMENT REQUIREMENTS

- A. Position equipment to result in good appearance and easy access to all components for maintenance and repairs.
- B. Install piping, flues, breeching and ducts so that they do not interfere with equipment access.
- C. Install level, secure and out of moisture. Provide shims, anchors, support straps, angles, grouted bases, or other items as required to accomplish proper installation.
- D. All screws, nuts, bolts and washers shall be galvanized, cadmium plated or stainless steel. After fabrication, hot-dip galvanize unfinished ferrous items for outdoor, below grade or other use subject to moisture.

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- E. Extend 1/2" Schedule 40 black steel pipe lubrication tubes from all hard to reach locations to front of equipment or to access points. Terminate with proper type of lubrication fitting.

3.06 VALVES AND STRAINERS

- A. If no shut-off is indicated, provide ball valves at inlet connections and balance valves at outlet connections to fixtures and equipment. Provide proper valve trim for service intended.
- B. Use no solder end valves unless noted otherwise; provide adapters in copper tubing systems.
- C. Locate valves with stems above horizontal plane of pipe. In general, locate valves within six (6) feet of floor, out from under equipment, in accessible locations with adequate clearance around hand wheels or levers for easy operation.
- D. Provide all valves, cocks and strainers, full pipe size unless indicated otherwise.
- E. Provide hand wheel operators on all valves 6" and larger, under 6" lever operators may be used.
- F. Provide tool operated valve with stainless steel shaft extension and 'on deck' tool operation for surge chamber butterfly isolation valve.

3.07 IDENTIFICATION OF PIPING

- A. Identify each valve by a numbered brass tag with hole and brass chain mounted on valve stem or handle. Tag to be a minimum of 1" in diameter and numbers at least 1/4" high stamped into tag.
- B. Install an identification chart in a plastic or glass framed enclosure, which schematically illustrates the proper operation of all piping systems and indicates number and location of all valves and control devices within the system.
- C. The direction of flow for the recirculation equipment shall be labeled clearly with directional symbols such as arrows on all piping in the equipment area. Where the recirculation equipment for more than one pool is located on site, the equipment shall be marked as to which pool the equipment serves.

3.08 TESTS

- A. Perform tests in presence of Owner's Representative with no pressure loss or noticeable leaks.
- B. Do not include valves and equipment in tests. Include connection to previously tested sections if systems are tested in sections.
- C. Perform tests as follows:

System	Test Pressure	Test Medium	Duration
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Skimmer Lines and Lawson Main Drain sump lines	20psig	Water*	4 hours
Pool Piping	50 psig	Water*	4 hours
Pool Main Drains	30 psig	Water*	4 hours
Domestic Water	150 psig	Water*	4 hours

*Never test PVC pipe or fittings with air or other gases, always use water.

3.09 PIPE MATERIAL APPLICATION

- A. PVC Schedule 40: Below grade swimming pool piping and domestic water piping up to 12” line size; use standard solvent weld fittings.
- B. PVC Schedule 80: Above grade swimming pool piping up to 12” line size; use solvent weld Schedule 80 or epoxy coated cast iron fittings.
- C. Type L Hard Copper: Above grade domestic water piping.
- D. CPVC Schedule 80; Pool Heater Piping.
- E. Schedule 40 Steel: Natural gas piping.

3.10 CUTTING AND DRILLING

- A. Cutting or drilling necessary for installation of Work of this Section shall be done only with approval of Owner’s Representative.

3.11 CLOSING-IN OF UNINSPECTED WORK

- A. Do not cover or enclose Work before testing and inspection. Re-open Work prematurely closed and restore all Work damaged.

3.12 QUIETNESS

- A. Quietness is a requirement. Eliminate noise, other than that caused by specified equipment operating at optimum conditions, as directed by Owner’s Representative.

3.13 FLUSHING OF LINES

- A. Flush or blow out pipes free from foreign substances before installing valves, stops or making final connections. Clean piping systems of dirt and dust prior to initial start-up.
- B. Just prior to plastering the pool, under the observations of the IOR, the pool mechanical system shall be flushed using the pool circulation pump. Circulate water through the mechanical system until the effluent water from the pool return heads runs clean.

3.14 CLEAN-UP

- A. After all Work has been tested and approved, the Swimming Pool Subcontractor shall thoroughly clean all parts of the equipment

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installations, including all pool pipe and fittings in the pool mechanical room. Exposed parts shall be cleaned of cement, plaster and other materials and all grease and oil spots removed with solvent.

- B. The Swimming Pool Subcontractor shall remove debris from the Project site. Cartons, boxes, packing crates and excess materials not used, occasioned by this work shall be disposed of to the satisfaction of the Owner's Representative.
- C. If the above requirements of clean up are not performed to the satisfaction of the Owner's Representative, the Owner reserves the right to order the work done, the cost of which shall be borne by the Swimming Pool Subcontractor.

END OF SECTION 13 11 07

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SECTION 13 11 08

SWIMMING POOL ELECTRICAL

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Provide labor, materials and equipment as required to install the swimming pool electrical system including but not limited to:
1. A complete and operable system of service equipment, switchboards, panelboards, conduits, switches, time clocks and wiring for power and lighting, motor control centers.
 2. Junction and/or pull boxes, conduits, disconnects, starters, contactors, wiring and connection of all motors and mechanical equipment, including connection and wiring of line voltage controls associated with the mechanical systems.
 3. Swimming pool underwater lighting systems.
 4. Swimming pool timing system outlets and scoreboard.
 5. Complete grounding system as required and shown on the Drawings.
 6. Complete equipotential bonding system as required and shown on the Drawings.
 7. Adjusting and preliminary operation of the completed electrical system as described in Article 3.06, A of this Section.
 8. Cleaning of all completed Work and installation adjustment of all trim and decorative items.

1.02 QUALITY ASSURANCE

- A. Qualifications of Workers:
1. The entity performing the work of this Section shall have been successfully engaged in the respective trade for at least five (5) years immediately prior to commencement of the Work.
 2. For actual construction operations, use only trained and experienced workers with a minimum of three (3) years experience with the materials and methods specified.
 3. Provide at least one person who shall be present at all times during execution of the work of this Section, with a minimum of five (5)

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years experience with the type of materials being installed, the referenced standards, and who shall direct all Work performed under this Section.

- B. Ordinances and Codes: Materials and construction shall conform with all applicable code requirements, including:
 - 1. National Electrical Code, latest edition; Electrical Safety Orders of the State of California; Department of Industrial Relations; regulations of the State Fire Marshal; rules and regulations of the Board of Underwriters of the Pacific, UL 50, 50E and NEMA 250 rating.
 - 2. Chapter 31 of California Building Code, latest edition.

- C. Verification of Conditions:
 - 1. The locations shown on the Drawings are diagrammatic only and the exact finish location of equipment and materials cannot be indicated. Therefore, locations of all Work and equipment shall be verified to avoid interferences, preserve head room and keep openings and passageways clear. Changes shall be made in locations of equipment and materials which may be necessary to accomplish these purposes.

- D. Preliminary Operations and Testing:
 - 1. Motor driven equipment shall be tested for correct rotation and completion of all connections.

1.03 SUBMITTALS AND SUBSTITUTIONS

- A. Provide submittals in conformance with the requirements of Section 01 33 00. Requests for substitutions shall conform with requirements of Article 1.10 of Section 13 11 00.

- B. Required submittals include:
 - 1. Conduit and Fittings as specified in Article 2.02 of this Section.
 - 2. Panelboards as specified in Article 2.06 of this Section.
 - 3. Circuit Breakers as specified in Article 2.07 of this Section.
 - 4. Motor Starters as specified in Article 2.10 and 2.11 of this Section.
 - 5. Fuses as specified in Article 2.13 of this Section.
 - 6. Time Clocks as specified in Article 2.14 of this Section.

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- 7. Ground Fault Circuit Interrupters as specified in Article 2.15 of this Section.
 - 8. NEC required corrosion resistant enclosures, cabinets and boxes as specified in Article 2.08, 2.11, 2.16 & 2.18 of this Section.
- C. Submit proof of qualifications as specified in Article 1.02.A of this Section.

1.04 PRODUCT HANDLING

- A. Delivery: Deliver all materials to the Project Site in the manufacturer's original unopened containers with all labels intact and legible.
- B. Storage: Store all materials under cover in a manner to prevent damage and contamination, and store only the specified materials at the Project site.
- C. Protection: Use all means necessary to protect swimming pool electrical materials before, during, and after installation and to protect the installed Work specified in other Sections.

PART 2 PRODUCTS

2.01 MATERIALS, GENERAL

- A. Materials shall be new, in unbroken packages and bear the U.L. label of approval.
- B. Equipment of one type shall be by same manufacturer. One type of equipment for classifications such as:
 - 1. Switchboards, panels, buss duct, disconnect switches and allied items.
 - 2. Conduit.
 - 3. Wire.
 - 4. Conduit fittings.
 - 5. Fixtures of the same general type.
 - 6. Wiring devices.

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2.02 CONDUIT AND FITTINGS

- A. Conduit within or under buildings or where exposed outdoors shall be rigid metal threaded, hot dipped, galvanized, or U.L. approved plastic except where noted otherwise on the Drawings. Metallic conduit shall be of the same metal between outlets or terminals.
- B. Use flexible metallic conduit only for short connections of motors and where specifically called for on Drawings. Maximum length shall be 40". Use only liquid tight flexible metal conduit. Install an unbroken #12 AWG insulated copper grounding conductor in each liquid tight flexible conduit with permanent connection at motor junction box and service panel ground.
- C. Protect, before installation, metallic conduit runs in all slabs laid on grade or in contact with the earth or exposed in damp locations, with two (2) heavy coats of asphaltum rust-resisting compound.
- D. Encase conduits 2-1/2" or larger run underground, outside, or under buildings, in concrete envelopes a minimum of 3" thick, except as indicated otherwise on Drawings or stubouts. Conduits 2 and smaller laid 18" below finish surface in soil.
- E. Low voltage runs underground outside buildings, 1-1/4" or smaller, may be G.I. or sherardized steel conduit, with machine applied wrapping equal to double wrap or Scotch-Wrap #50 tape, half lapped and quadrupled at joints in lieu of concrete encasement.
- F. Service conduits through foundations or concrete members shall run through metal sleeves with adequate clearances for full movement of the conduit. Do not run conduits through footings.
- G. Secure conduits run exposed on surfaces with one hole heavy-duty straps or fasten with matching fittings to inserts or trapezes, parallel to building walls and ceilings.
- H. Cap all conduit or duct stub-outs with standard factory caps; except cap threaded steel conduit with B.I. water pipe caps in outdoor locations.
- I. Use conduit fittings as manufactured by Crouse-Hinds Company, Appleton Electric Co., or approved equal.

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- J. Employ U.L. liquid tight fittings for use with liquid tight flexible metal conduit.
- K. Use unions as manufactured by Appleton, O-Z/Gedney, or approved equal. The use of running threads will not be permitted.
- L. Exposed conduit and fittings in chemical rooms shall be nonmetallic rigid polyvinyl chloride, corrosion resistant rated suitable for installation in corrosive environments and in accordance with the latest NEC requirement.

2.03 EQUIPOTENTIAL BONDING / GROUNDING

- A. Bond together and ground to a common ground at a single point all metallic conduit, piping systems, pool reinforcing steel, metal parts of ladders, lifeguard stands, handrails and their supports and the like. The solid copper bonding conductor shall not be smaller than #8 copper.

2.04 WIRING CONNECTIONS

- A. Make connections without strain on conductors, allowing the conductors to take a natural position after connections or taps are made. Include all strand of wire in making the connection.
- B. Make connections for wiring by one of the following means:
 - 1. Make all taps or connections to conductors with compression type connectors except those smaller than #8 B&S gauge may have soldered connections. Solderless connections for #10 AWG or smaller may be used and shall be "Scotchlok", Buchanan, or approved equal. For #8 AWG or larger, they shall be T&B "LockTite", Burndy "Versitaps", or approved equal.
 - 2. All cable or conductor terminal lugs shall be Burndy "Quicklug", IlSCO, or approved equal. Two piece stamped lugs and solder lugs will not be approved.
 - 3. Paint taped splices in damp or outdoor locations with two (2) coats of insulating paint.
 - 4. Tag all branch circuit wires with circuit number at the panelboard and at each point of use with linen or plastic tags.

2.05 CONDUCTORS

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- A. Copper RHW or THW. Do not make splices between boxes.

2.06 COLOR CODING

- A. Neutrals (identified conductors shall be white).
- B. Phase conductors shall be red for phase B; blue for phase C.
- C. Green shall be used for mechanical equipment and receptacle grounds only.

2.07 MOTOR WIRING

- A. Make final connections to motors with the required AWG (Minimum #12), Flamenol machine tool wire, 19 strand. Control wiring for equipment shall be Flamenol machine tool wire, 19 strand of required AWG. Provide corrosion resistant junction boxes at each item of equipment to change from standard building wiring to machine tool wire.
- B. Phase motors as proper in direction of rotation.

2.08 PANELBOARDS

- A. Panelboards shall be flush or surface mounting as indicated with circuit breakers as shown on panel schedule, hinged lockable doors, index card holders and proper bussing.
- B. Where indicated on the drawings, panelboards shall be furnished with subfeed breakers and/or lugs, split bussing, contractors, time switches, relays, etc., as required.
- C. All panelboards shall be keyed alike.
- D. All panelboard enclosures shall be corrosion resistant rated in accordance with the latest NEC requirements.
- E. Furnish corrosion resistant panelboard enclosures and terminal cabinets with Yale 46515 flush locks and LL806 keys except where indicated otherwise herein. Fasten the trim to panel boards and terminal cabinet by means of concealed, bolted or screwed fasteners accessible only when the door is open.

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- F. Panelboards 208/120 volt, three phase, 4 wire, S/N or 120/240 volt, single phase, 3 wire, S/N.

Panelboard types as manufactured by:

Westinghouse	Type B10B
General Electric	Type NLAB
Square D	Type NQOB

- G. Panelboards for 480/277 volt, three panes, 4 wire, S/N.

Panelboard types as manufactured by:

Westinghouse	Type Pow-R-Line 2
General Electric	Type AE
Square D	Type NEHB
Sylvania	Type NH1B
I.T.E.	Type Approved Equal

- H. Panelboard for bussing sizes thru 400 amp shall be 20" wide surface mounted type. Recess mounted type shall have a 20" wide (maximum) recess metal enclosure with trim plate cover extending 1" on all sides of enclosure. Depth shall be 5-3/4" nominal. Height of panel as required for devices.

- I. Provide 6" additional gutter space in all panels where double lugs are required, or where cable size exceeds bus size. Minimum bottom gutter space shall be 6" high. 12" additional gutter space may be required for aluminum feeders where used.

- J. Panelboards shown on the drawings with relays, time clocks or other control devices shall have a separate metal barriered compartment mounted above panel with separate hinged locking door to match panelboard. Provide mounting sub-base in cabinet for control devices and wiring terminal strips.

- K. Panelboard shall have a circuit index card holder removable type, with clear plastic cover. Index card shall have numbers imprinted to match circuit breaker numbers.

2.09 CIRCUIT BREAKERS

- A. Breakers shall have a minimum short circuit interrupting rating of 10,000A symmetrical for panelboard voltage thru 240 volt and 14000A for

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panelboards thru 600 volts or as specified on the drawings. In no case shall the interrupting rating be less than the bus withstand rating unless noted otherwise on the drawings.

- B. Circuit breakers as manufactured by the following companies only are acceptable:
1. General Electric Company
 2. Square D Company
 3. Westinghouse Company
 4. I.T.E. Company
- C. Circuit breakers shall be arranged in the panels so that the breakers of the proper trip settings and numbers correspond to the numbering in the panel schedules on the drawings. Circuit numbers of breakers shall be black-on-white micarta tabs or other previously approved method. Circuit number tabs which can readily be changed from front of panel will not be accepted. Circuit number tabs shall not be attached to or be a part of the breaker.
- D. Where two or three pole breakers occur in the panels, they shall be common trip units. Single pole breakers with tie-bar between handles will not be accepted.
- E. All circuit breakers shall be padlockable in the "off" position. Locking facilities shall be riveted or mechanically attached to the circuit breaker (submit sample for approval). Other means of attachment shall not be accepted without prior written approval of Architect.
- F. Where branch circuit breakers supply the power to motors and signal systems, the breakers shall be furnished with lockout clips, mounted in the "on" position. The breakers shall be able to trip automatically with lockout clips in place.
- G. Panelboard circuit breakers shall be bolt-on type.

2.10 BUSSING

- A. Bussing shall be rectangular cross section copper, or full length silver or tin-plated aluminum.

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- B. Bussing shall be braces to withstand symmetrical short circuit ratings as follows or as noted on drawings. In no case shall bus short circuit bracing be less than specified circuit breakers.
- C. Each panelboard shall be equipped with a ground bus secured to the interior of the enclosure. The bus shall have a separate lug for each ground conductor. No more than one conductor shall be installed per lug.

2.11 POOL MECHANICAL EQUIPMENT ENCLOSURES, TERMINAL CABINETS & MISC CABINETS

- A. All pool mechanical equipment enclosures, terminal cabinets and miscellaneous cabinets in the pool mechanical room or chemical storage rooms shall be corrosion resistant rated in accordance with the latest NEC requirements. Enclosures and all cabinets shall be flush mounted (except where noted a surface) of the size indicated on the drawings, and complete with hinged lockable doors and the number of 2-way screw terminals required for termination of all conductors. Terminal cabinet locks to operated form same key used for panelboards. The trim to terminal cabinets shall be fastened by means of concealed bolted or screwed fasteners accessible behind door to terminal cabinets. Terminal cabinets shall have 5/8" plywood backing.
- B. Provide engraved nameplate on each enclosure and cabinet indicating its designation and system (i.e., Swimming Pool - Panel 'SP').

2.12 MOTOR CONTROL INDIVIDUAL STARTERS

- A. Manual Motor Starters:
 - 1. Provide flush or surface mounting manual motor starters with number of poles and size of thermal overload heaters as required for the motor being controlled (equipped with overload heaters, one for each motor lead). Back boxes shall be supplied with all flush mounting starters whether they are toggle type requiring only a 4" square outlet box or the larger type requiring a special box and cover designed to accept the particular unit. All box types shall be corrosion resistant rated in accordance with the latest NEC requirements.
 - 2. Unless otherwise noted on the drawings, all manual starters for single phase motors, smaller than 1 h.p., shall be the compact toggle type. Manual starters for all single phase motors, 1 to 5 h.p., and all three phase motors up to 5 h.p. shall be the heavy duty type.

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3. Where manual motor starter is shown with pilot light, the pilot light shall be installed in a separate outlet box adjacent to the starter outlet, and engraved nameplate in indicate function of pilot light.

4. The following motor starters as manufactured by:

Manufacturer	Single Phase 1HP and Below	Others
Arrow Hart	Type RL	Type LL
General Electric	CR 101	Class CR 1062
I.T.E.	Class C10, C11 or C12	Class C20
Square D Company	Class 2510, Type A	Class 2510, Type B & C
Westinghouse	Type MS	Type A100
Allen Bradley	Approved Equal	Approved Equal.

B. Individual Magnetic Motor Starters:

1. Magnetic motor starters shall be A.C. line voltage, across-the-line units in a corrosion resistant rated enclosure in accordance with the latest NEC requirements.
2. All starters located outside of a building whether or not indicated shall be W.P. (weatherproof), and all starters noted W.P. shall be furnished in a corrosion resistant rated stainless steel enclosure in accordance with the latest NEC requirements.
3. Starter shall be horsepower rated for the motor controlled, and shall be equipped with properly sized overload elements. Every pole shall be with overload element.
4. Verify the exact motor current and voltage characteristics with the Contractor supplying the motor before installation of a starter.
5. Each starter shall be equipped with "Hand-Off-Auto" switch or stop-start pushbutton as required.
6. Coils shall be designed to operate on voltage indicated on control diagrams and have built-in-under the voltage release for coil circuit to drop motor starter off the line when the line voltage drops below normal operating voltage.
7. The coil control circuit shall be independently fused, sized to protect coil.
8. Starters to be equipped with running pilot light indication with a "Push-to-Test" feature.

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9. Magnetic starters shall have a minimum of two auxiliary contacts. Additional auxiliary contacts shall be provided as required to comply with the requirements of the wiring diagrams on the electrical and mechanical drawings and the description of the function in the Mechanical Section of the Specifications.
10. Minimum starter size shall be NEMA size I unless indicated otherwise.
11. The following types of magnetic motor starters as manufactured by:

Manufacturer	Type
General Electric	Class CR 106
I.T.E.	Class A20
Square D Company	Class 8536
Westinghouse	Type A200 (Size 4 Max.) or Class II-200 (Sizes 5-8)

2.13 INDIVIDUAL COMBINATION MOTOR STARTERS

- A. Combination starter shall incorporate fused disconnect switch and individual magnetic motor starter. Combination starters shall be mounted in a corrosion resistant rated enclosure in accordance with the latest NEC requirements.
- B. Starters shall comply with NEMA standards, size and horsepower ratings as indicated on drawings General Electric, Square D, Westinghouse or I.T.E.
- C. The disconnect handle used on combination starters shall control the disconnect device with the door opened or closed. The disconnect handle shall be clearly marked as to whether the disconnect device is "ON" or "OFF", and shall include a two-color handle grip, the black side visible in the "OFF" position indicating a safe condition, and the red side visible in the "ON" position indicating an unsafe or danger condition.
- D. All starters used in combination starters shall be manufactured in accordance with the latest published NEMA standards, sizes, and horsepower ratings. These starters shall be furnished with three melting alloy type thermal overload relays.
- E. Thermal units shall be of one-piece construction and interchangeable. The starter shall be inoperative if a thermal unit is removed.

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2.14 MOTOR CONTROL CENTER, INTERLOCKS AND CONTROL DEVICES

- A. Refer to mechanical and plumbing drawings and specifications and provide all control devices including timeswitches, relays and interconnection of starters of required.
- B. Mount all relays and timeswitches in a separate compartment in motor control center unless otherwise indicated.
- C. Whether shown on mechanical and plumbing drawings or control center schedules or not, where motors are controlled by external devices (i.e., thermostats, relays, float or pressure switches, etc.) or interlocked with other motors, each motor starter to be equipped with a "Hand-Off-Auto" selector switch in starter cover. Other starters equipped with a "Start/Stop" pushbutton station in starter cover. The Contractor shall be responsible to submit a complete and detailed set of shop drawings, electrical schematic design along with electrical component cut sheets from the MCC panel or the interlock control device manufacturer. RSD Total Control: Allan Pearson 949-380-7878, South Coast Controls: Anthony Ellis 714-998-5656 or approved equal.

2.15 FUSES

- A. Fuses shall be dual element, current limiting type, U.L. Class RK5 unless otherwise indicated on the drawings. Provide one spare set of fuses of each size and type in each motor control center.

2.16 TIME CLOCKS

- A. Time clocks shall be provided for all underwater lighting systems and swimming pool circulation pumps not controlled by filter microprocessors.
- B. Contacts shall have a minimum rating of 40 amperes at 277V.
- C. Timing motor shall be heavy duty synchronous, self starting, high torque type, and shall be rated at 120, 208, 240, 277 volt 60 Hz.
- D. Motor shall operate normally at temperature range of -60 degrees Fahrenheit to +120 degrees Fahrenheit.
- E. Dial shall be 3" diameter, clearly calibrated with day/night zones and 24-hour rotation, with gear to provide one revolution yearly which

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automatically varies the on/off settings each day according to seasonal changes. Day and month of the year shall show clearly through calendar window on the dial.

- F. Time clocks shall be equipped with 7-spoke omitting wheel marked with days of the week.
- G. Time clocks shall be housed in a corrosion resistant rated enclosure in accordance with the latest NEC requirements.
- H. Acceptable manufacturers are Intermatic, Tork, Paragon, or approved equal.

2.17 GROUND FAULT CIRCUIT INTERRUPTERS

- A. Minimum rating shall be 20 amperes, 125V, 5 milliampere trip setting, Class A per UL943.
- B. Manufacturer to be Crouse-Hinds, Leviton, or approved equal.

2.18 BOXES

- A. Boxes shall be of the size required by ordinances or larger, must be corrosion resistant in accordance with the latest NEC requirements where concealed or exposed on ceilings or walls.
- B. Outlets to be surface where wiring is exposed and flush in areas where conduit is concealed.
- C. Provide surface outlets with proper corrosion resistant surface covers. Box and cover shall be deep enough to provide at least 1/4" clearance between back of device and back of box. Where box contains more than one device, use a corrosion resistant rated gang box with proper cover in accordance with the latest NEC requirements. Surface outlet boxes shall be of the threaded hub type wherever below 8'0".
- D. If necessary for cable installation, additional pull boxes or junction boxes may be installed in accessible locations. Exposed pull boxes and junction boxes shall be corrosion resistant rated in accordance with the latest NEC requirements.

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- E. Where exposed to weather pull boxes larger than outlet boxes are required, galvanized code gauge sheet steel boxes may be used with covers attached by brass machine screws may be used. Boxes exposed to the weather shall be approved for the purpose, and conduit entrances shall be on the bottom made by means of an interchangeable hub with gasket and adapter nut. Pull boxes not shown on Drawings may be added only after approval of size and location is obtained.
- F. For outlets exposed to weather or where noted, cast outlet boxes shall be Crouse-Hinds, Appleton, or approved equal. Boxes shall have proper number and size hubs. Device plates, covers, adapters and boxes shall be as manufactured by Crouse-Hinds, Appleton, or approved equal.
- G. Exposed junction boxes, outlet boxes and pull boxes for pool chemical rooms shall be non-metallic suitable for a corrosive environment and in accordance with the latest NEC requirements.

2.19 IDENTIFICATION MARKINGS

- A. Plainly mark all motor and electrical appliance control equipment indicating the equipment controlled with engraved metal tags.
- B. Provide laminated plastic nameplates on panelboards on the outside of the door at the top indicating panel designation and feeder source.
- C. Provide laminated plastic nameplates on distribution switchboards and motor control centers at the top center indicating panel designation and feeder source.
- D. Identify each distribution switchboard and motor control center circuit breaker with a laminated plastic nameplate indicating its' use.
- E. Type panelboard directories on the forms provided with the equipment, indicating the use of each branch circuit breaker.
- F. Fasten all laminated plastic nameplates to surfaces with two (2) or more screws.

PART 3 EXECUTION

3.01 INSPECTION

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- A. Verify conditions at the Project site before submitting bid. Be responsible for providing all necessary wiring for the new electrical systems. Wherever wiring is being disrupted due to remodeling or changes, reconnect existing and provide new wiring circuits to accomplish a fully operable system at no additional cost to the Owner.

3.02 COORDINATION

- A. The Drawings are essentially diagrammatic and indicate the desired location, size, routes, connection points, etc., and are to be followed as closely as possible. Proper judgment must be exercised in executing the Work so as to provide the best possible installation in the available space and to overcome difficulties, limitations or interference wherever encountered. Be responsible for the correct placement of this Work, the proper location and connection in relation to Work of other trades, for determining the exact location of all conduits, outlets and equipment, and for installing the conduits in such a manner as to conform to the structure, avoid obstruction, preserve headroom and keep openings and passageways clear. Particular attention is directed to the close coordination required on exposed Work. Locations shown on Architectural or Mechanical Drawings if different than those shown on Electrical Drawings should be communicated to the Owner's Representative in writing for clarification.

3.03 INSTALLATION

- A. Trenching and Backfill: Conform with requirements of Section 13 11 01. Provide minimum cover as required by Code.
- B. Conduit Installation:
1. Conduit and metallic raceway systems shall be mechanically and electrically continuous from sources of current to all outlets in a manner to provide a continuous grounding path. Close ends of conduit during construction to prevent entrance of dirt or moisture.
 2. Securely fasten conduit to the building construction within three feet of each outlet and within every ten feet thereafter. Secure it to boxes, cabinets, pull boxes, terminals with two locknuts and ends equipped with bushings or a terminal fitting. Cut square with ends carefully reamed.
 3. Make bends or elbows so that the conduit will not be injured or flattened.
 4. Use insulated metallic bushings in all places where bushings are required.

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5. Run exposed conduits level or plumb and parallel to the construction members of the building. No cutting across or diagonal runs will be permitted. Neatly surmount structural obstructions encountered on conduit runs by the use of fittings or pull boxes.
6. Identify feeder conduits by stamped metal tags secured to exposed section of conduit in main or sub-panels.
7. Make up all threaded conduit joints gas and watertight with conductive sealer except conduit above ground in dry indoor locations.
8. Rigidly support all boxes independently of the conduit system.

C. Connections to Equipment:

1. Fully connect, in an approved manner, all electrical outlets, apparatus, motors, equipment, fixtures, wiring devices and appliances whether they are installed under the Electrical Contract or not, which require electrical connections, to the corresponding electrical system outlet.
2. Where the Work of this Section requires connections to be made to equipment that is furnished and set-in-place under other Sections, obtain such roughing-in dimensions from the manufacturer or supplier of each item as required and assume full responsibility for the installation of the connections thereto.

3.04 ADJUSTMENT AND CLEAN-UP

- A. Preliminary Operation: Should the Owner's Representative deem it necessary to operate the electrical installation or any part thereof prior to Substantial Completion of the Work, consent to such preliminary operation and supervise conduction of same. Subcontractor shall pay all costs occasioned by such operation. Preliminary operation shall not be construed as an acceptance of any Work installed under this Contract.
- B. Clean-up: Upon completion of the Work of this Section, immediately remove all swimming pool electrical materials, debris and rubbish occasioned by this Work to the approval of the Owner's Representative.

END OF SECTION 13 11 08

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SECTION 13 34 24

PRE-FABRICATED RESTROOM BUILDING

PART 1 - GENERAL

1.1 SCOPE

- A. The work covered by this section includes furnishing and installing all items necessary to install complete in place a pre-fabricated restroom building. Items shall include, but are not limited to, the following:
1. Manufacturer coordination
 2. Site preparation
 3. Utility and plumbing connections
 4. Electrical connections
 5. Concrete foundation
 6. Erection and placement of pre-fabricated building
 7. Roof Installation
 8. Guarantees

1.2 STANDARDS

- A. Unless otherwise shown or specified, all materials and methods shall conform to the appropriate current sections of:
1. City Standards for Public Improvements.
 2. The State of California, Department of Transportation (Caltrans), Standard Specifications (DTSS) except for measurement and payment requirements.
 3. Applicable ASTM Specifications as they reasonably apply to this work, except for measurement and payment requirements.
 4. American Concrete Institute (ACI), current standards.
 5. The Uniform Building Code, latest edition, for all applicable requirements.
 6. Refer to Section 24 of the UBC for all disabled person requirements.
 7. Refer to the Uniform Plumbing Code, latest edition, for all applicable requirements.

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8. Refer to National Electric Code, latest edition, for all applicable requirements.

1.3 SUBMITTALS

- A. Contractor shall submit calculations and Shop Drawings for all aspects of the prefabricated building, its components and installation requirements to meet the design requirements indicated on the drawings and specifications. Calculations must be signed by a Structural Engineer registered to practice in California.
- B. All work in this section shall be reviewed by the City's Representative. Contractor shall schedule work and notify the City's Representative two working days in advance of each portion of work for their review.
- C. Contractor shall submit Shop Drawings and calculations within fifteen (15) working days after award of contract. Allow two weeks for review of drawings by City's Representative.

1.4 GUARANTEE

- A. Manufacturer shall provide a written warranty on parts, accessories and components of the pre-fabricated restroom building against defects in material and workmanship for a period 24 months.
- B. Provide 3-year warranty on the contractor's items of work.

PART 2 - PRODUCTS

- 2.1 RESTROOM BUILDING: shall be "Jupiter Fully Automated Twin Toilet" model JUP22DD with Recessed Steel Baby Changing Table, Large Disposal Chute, Remote Web-Based Monitoring and control, Electronic Rotary Latches for EMD8200 and WS600 as available from Exeloo Corporation. San Luis Obispo, CA (800) 676-5290 or approved equal.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Refer to Geotechnical Investigation report GEOTECHNICAL ENGINEERING REPORT MCKINLEY PARK RENOVATION By GEOCON CONSULTANTS, INC. dated, April 2022 for all soils requirements.
- B. All soils compaction and concrete work shall conform to the applicable ASTM tests.
- C. The work covered by these specifications shall be performed under the observation of the City's Representative. The Contractor shall cooperate

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with the City's Representative in performing all observations and tests to evaluate field and material quality and compaction.

3.2 INSTALLATION

- A. Contractor shall furnish all materials, labor and supervision necessary to completely install and finish the building in accordance with erection instructions from building manufacturer and plans and specifications.

3.3 SITE PREPARATION

- A. Identify location and sizes of existing water, sewer and electrical utilities and protect as

necessary to allow site grading. Verify water service line from meter to building has 1.25"

minimum inside diameter and flows a minimum of 15 gallons per minute. Size-up from

meter to new structure as necessary. Verify the water meter size is a minimum of 1".

- B. Lay out building footprint, grade area and compact in preparation for installation of pour in

place concrete Grade Beams. Grade around building to slope away from Finished Floor

Elevation (FFE) of Building at a minimum of 1%. Walkways connecting to entrances of

building to have maximum of 2% longitudinal slope and level cross slope.

- C. Extend utilities to where penetrations will be, but 3' clear of the outside edge of the

building slab.

3.4 FOOTING CONSTRUCTION AND UTILITY EXTENSION

- A. Building slab is 5 3/4". Set each top of Grade Beam and building FFE accordingly.

- B. Grade Beams to be installed over compacted base and compacted native soil.

3.5 BUILDING PLACEMENT, ROOF INSTALLATION AND UTILITY CONNECTION

- A. Coordinate delivery and placement of building
- B. Sewer adapter fittings extending from building to be installed prior to building placement.
- C. Place building – shim as necessary to properly level.
- D. Secure building foundation to Grade Beams.

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- E. Install insulated panel roofing and gutter
- F. Install downpipe and vent pipe.
- G. Connect sewer, water and electrical. All connections to be made by experienced and
- H. skilled persons. Electrical work to be performed by a Certified Electrician. Plumbing
- I. (sewer and water) work to be installed by a licensed plumber.

3.6 ELECTRICAL AND COMMUNICATION TESTING

- A. Follow manufacturer's instructions prior to powering-on the building, for testing and final programming for each installation. Contractor shall coordinate with Exeloo representative final operational testing and communication testing. Final testing shall be done in the presence of the City representative.

3.7 SITE CLEAN-UP

- A. Contractor shall keep the site safe and clean throughout construction operations. Final clean-up shall include raking and leveling of any remaining adjacent exposed ground within ten (10) feet of building to provide a uniform grade between the building and adjacent walkways or other improvements. There should be a smooth transition from 2" below the building FFE to the adjacent grade at a slope no greater than 1 in 10, all to the satisfaction of the City representative.
- B. All construction spoils shall be removed from the site at the end of each day and upon project completion, to the satisfaction of the City representative.

END OF SECTION 13 34 24

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SECTION 22 05 00

GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 INCLUSIONS:

- A. This section applies for all Division 22 and 23 sections. All conditions and materials are pertinent to the other sections as if repeated in those sections.
- B. Furnish and install any incidental work not shown or specified which is necessary to provide a complete and workable system.

1.02 DRAWINGS:

- A. Examine all Drawings prior to bidding of work and report any discrepancies in writing to the Architect.
- B. Drawings showing location of equipment, piping, ductwork, etc., are diagrammatic and job conditions will not always permit their installation in the location shown. The Mechanical Drawings show the general arrangement of all piping, ductwork, equipment, etc., and shall be followed as closely as existing conditions, actual building construction and the work of other trades will permit. The Architectural and Structural Drawings shall be considered a part of the work insofar as these Drawings furnish the Contractor with information relating to design and construction of the building. Architectural Drawings shall take precedence over Mechanical Drawings. Because of the small scale of the Mechanical Drawing, it is not possible to indicate all offsets, fittings and accessories which may be required. The Contractor shall investigate the structural and finish conditions affecting the work and shall arrange his work accordingly providing such fittings, valves and accessories as may be required to meet conditions. When job conditions do not permit installation of equipment, piping, ductwork, etc., in the locations shown, it shall be brought to the Architect's attention immediately and the relocation determined in a joint conference. Contractor will be held responsible for the relocation of any items without first obtaining the Architect's approval. Contractor shall remove and relocate such items at his own expense if so directed by the Architect.
- C. Execute work mentioned in the Specifications and not shown on the Drawings, or vice versa, the same as if specifically mentioned in both.

1.03 CODES:

- A. Provide all work and materials in full accordance with the latest rules and regulations of the California Code of Regulations (CCR), Title 21, Title 22, and Title 24, as applicable, Safety Orders of the Division of Industrial Safety, (Cal OSHA); the California Electric Code; the California Plumbing Code; the California Building Code; California Mechanical Code; State

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Fire Marshal; and other applicable laws or regulations. Nothing in these plans or specifications is to be construed to permit work not conforming to these codes. Furnish without extra charge, any additional material and labor required to comply with these rules and regulations.

- B. Where material or equipment is specified to conform to standards such as American Society of Testing and Materials (ASTM), Underwriters' Laboratories, Inc., (UL), American National Standards Institute (ANSI) and the like, it shall be assumed that the most recent edition of the standard in effect at the time of bid shall be used.

1.04 FEES AND PERMITS:

- A. Procure and pay for all permits and licenses required.

1.05 FRAMING, CUTTING AND PATCHING:

- A. Special framing, recesses, chases and backing for work of this section, unless specified otherwise, is covered under other sections. Be responsible for proper placement of all pipe sleeves, hangers and supports and location and sizing of openings for work of this section.

1.06 SUBSTITUTIONS AND MATERIAL LIST:

- A. Product names are used as standards of quality, items furnished as standard on specified equipment shall be furnished on all substituted equipment at no extra cost to the contract regardless of disposition of submittal data; other materials or methods shall not be used unless approved in writing by the Architect. The burden of proof as to the equality of any proposed material shall be upon the Contractor; Architect's decision is final. Only one request for substitution shall be considered for each item. Equipment capacities specified are minimum acceptable. Submittals will not be accepted until compliance with the requirements of Contract Documents has been confirmed by the Contractor.
- B. Unless stipulated otherwise in General Conditions and Division 1, submit a list of 7 copies of materials for approval within 35 days after the award of the Contract. It shall be accompanied by shop drawings, pump performance curves, fan curves, and other pertinent data, showing the size and capacity of the proposed materials. All materials to be used, whether substitutions or not, shall be listed in the order in which they appear in the specifications.
- C. Any mechanical, electrical, structural, or other changes required for the installation of any approved substituted equipment shall be made to the satisfaction of the Architect and without additional cost to the Owner. Approval by the Architect of the substituted equipment and/or dimensional drawings does not waive these requirements. Upon request, submit drawings of mechanical equipment spaces showing substituted equipment before installation.
- D. Review of material shall not be construed as authorizing any deviations from the specifications unless the attention of the Architect has been directed to the specific deviations.

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- E. Furnish to the Project Representative, upon request, complete installation instructions on all materials and equipment before starting installation of same.
- F. Submittals shall bear the specification reference or drawing location where they are specified. Submittals shall not be accepted in incomplete form. Submittals shall be organized into booklets for each specification section and submitted in indexed loose leaf binders with notation when it is a deviation from the specifications.

1.07 SITE CONDITIONS:

- A. Information on the drawings relative to existing conditions is approximate only. Deviations found necessary during progress of construction to conform to actual conditions, as approved by the Architect, shall be made without additional cost to the Owner. The Contractor shall be held responsible for any damage caused to existing services. Promptly notify the Architect if services are found which are not shown on drawings.

1.08 GUARANTEE:

- A. Repair or replace any defective work, materials or part which may appear within 1 year of the date of acceptance. This shall include damage by leaks.
- B. On failure to comply with the above guarantee within a reasonable length of time after notification is given, the Architect shall have the repairs made at the Contractor's expense.

1.09 MAINTENANCE AND OPERATING INSTRUCTIONS:

- A. Instruct the Owner's authorized representatives in operation, adjustment and maintenance of all mechanical equipment and systems. Provide three copies of certificate signed by Owner's representatives attesting to their having been instructed.
- B. Furnish three complete sets of operating and maintenance instructions bound in a hardback binder and indexed. Start compiling the data upon approval of list of materials. Final observation will not be made until booklets are approved by Architect.
- C. These sets shall incorporate the following:
 - 1. Complete operating instructions for each item of heating, ventilating, air conditioning and plumbing equipment.
 - 2. Test data and air and water balancing reports as specified.
 - 3. Typewritten maintenance instructions for each item of equipment listing in detail the lubricant to be used, frequency of lubrication, inspections required, adjustment, etc.
 - 4. Manufacturer's bulletins with parts numbers, instructions, etc., for each item of equipment, properly stripped and assembled.
 - 5. Temperature control diagrams and literature.

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6. A complete list or schedule of all major valves giving the number of the valve, location and the rooms or area controlled by the valve. Identify each valve with a permanently attached metal tag stamped with number to match schedule. Post list in frame under plastic on wall in mechanical room or where directed.

1.10 SCHEDULE OF WORK:

- A. All temporary connections required to maintain services, including adequate heat and cooling, during the course of this Contract shall be made without additional cost to the Owner. The normal function of the building must not be interrupted; notify the Owner seven (7) days in advance before disturbing any service.

1.11 RECORD DRAWINGS:

- A. Upon completion of the work and as a precedent to final payment, deliver to the Architect originals of all Drawings showing the work exactly as installed. Also deliver to the Architect one complete set of reproducibles of all Drawings showing the work exactly as installed. All Record Drawings shall be signed by the Contractor verifying their accuracy.

1.12 DELIVERY AND STORAGE:

- A. All equipment, ducting and piping delivered to site shall be protected from the weather, humidity and temperature variations, dirt and dust and other contaminants.

PART 2 - PRODUCTS

2.01 GENERAL:

- A. Materials or equipment of the same type shall be of the same brand wherever possible. All materials shall be new and in good condition.

2.02 ELECTRIC MOTORS:

- A. Shall be Allis-Chalmers, General Electric, Gould, Lincoln, or equal, selected for quiet operation. Furnish motors with splashproof or weatherproof housings, where required or recommended by the manufacturer. Match the nameplate voltage rating with the electrical service supplied. Check electrical drawings. Provide a transformer for each motor not wound specifically for system voltage. The minimum efficiencies shall be as defined by IEEE 112 Test Method B and NEMA Standard MGI-112-53B.

2.03 MOTOR STARTERS:

- A. Furnish starters with the proper size thermal overload units, ambient compensated. Provide 3-phase motor starters with 3-phase overloads. Magnetic starters shall have Hand-Off-Automatic switches and control transformers furnished integral with the starter when starter is serving an automatically controlled motor. Starters shall be Square D, Allen Bradley, or

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equal, in NEMA Type I enclosure inside and NEMA Type IIIIR outside as required. Minimum starter size shall be 1.

2.04 VALVES AND FITTINGS:

- A. Valves: Shall be DeZurik, Crane, Nibco, Kennedy, or equal.
1. Gate Valves thru 2-1/2" -- Crane #428, Kennedy #427, Nibco #T-595.
 2. Gate Valves 3" thru 4" -- Crane #460 or #461, Nibco #F-617.
 3. Gate Valves 5" and Larger --Demco NE, DeZurik #660 or Norris R3310 with throttling handle.
 4. Check Valves 2-1/2" and smaller -- Muessco #203BP, Crane #36, Nibco #T-413.
 5. Check Valves 3" and larger -- Muessco #105AP, Crane #373.
 6. Gas Valves -- DeZurik #425SIRS-49.
 7. Gas Cocks at Appliances -- ConBra Co. 50 Series.
 8. Gas Pressure Regulators -- Reliance #1803 or #2003, Rockwell or equal with internal relief for LPG.
 9. Valves in the ground shall be Crane #2487-1/2-0, Mueller #A-2380-21 or equal, and shall be installed in Christy Concrete Products #F1 valve box with C210 C.I. lid, Books #1-RT box with #1-RT C.I. lid or equal. Nut operated valves in Alhambra Foundry Co. #A-3004 or equal access boxes marked for service. Provide a tee handle wrench for each size. Set access boxes in 4" thick concrete pad, trowel smooth and edge, set flush with grade. Water service valve in ground shall be AWWA, 200 psi, nut operated.
 10. Valves in copper lines shall be furnished with adapters, or may be solder joint type of equal quality to screw type valves.
 11. OS&Y Gate -- Crane #459 thru 2", #467 for 2-1/2" and larger; Demco NE-H for 4" and larger.
 12. Ball Valves -- Worcester #411TS, Nibco #T-560, 2" maximum (use for air, vacuum, steam and high pressure gases).
 13. Vacuum Breakers, Makeup -- Cla Val Co. Type RP, Watts 909, reduced pressure type backflow preventer.
 14. Vacuum Breakers, General -- SMR #P-701 (1/2" to 1"); #P-711 (1-1/4" to 2"); #P-714 (2" and larger) with check valves, pressure type. SMR #H-400 (1/2"); #H-403 (3/4") atmospheric type.
 15. Flow Control Valves -- Bell & Gossett Circuit Setter Plus, Armstrong CBV, or equal thru 3", Circuit Sensor with hand valve above 3". Illinois Series 5000 will be acceptable thru 2".

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16. Balance Valves -- Rockwell 142 thru 2", 143 above 2"; Walworth 1796 thru 2", 1797F-1718F above 2".
17. Provide gate or globe valves on inlet of each water heater and inlet and outlet of each pump whether shown or not.
18. Butterfly Valves: Keystone 100, Crane Monarch 2200 or equal.

B. Unions and Flanges:

1. Steel 2" and smaller -- 150# screwed black or galvanized malleable iron, match pipe, ground joint, brass-to-iron seat.
2. Steel 2-1/2" and larger -- 150# black flange union, flat faced, full gasket.
3. Copper or brass pipe or tubing 2" or smaller -- 150# cast bronze ground joint, bronze-to-bronze seat with copper-to-copper end connections.
4. Copper or brass pipe or tubing 2-1/2" and larger -- 150# brass flange union, flat faced, full gasket.
5. Gaskets - Hot and cold water -- Garlock Style 320D.
6. Flange Bolts -- Open-hearth bolt steel, square heads with cold pressed hexagonal nuts, cadmium plated in ground. Provide copper plated steel bolts and nuts or brass bolts and nuts for brass flanges.

2.05 HANGERS AND SUPPORTS: All hanger components shall be Grinnell, Elcen, Super-Strut or equal.

- A. Vertical Piping: Grinnell #261, Elcen #39, or equal, clamps attached to the pipe above each floor, to rest on the floor: Provide with two wraps of 10 mil PVC tape on copper tubing. Provide additional support at base of cast iron risers.
- B. Individually Suspended Piping: Super-Strut C-711, Elcen #90, or equal complete with threaded rod. Provide insulation shield and hangers outside on all insulated water and steam piping.

<u>Pipe Size</u>	<u>Rod Size</u>
2" and smaller	3/8"
2-1/2 to 3-1/2"	1/2"
4" to 5"	5/8"
6"	3/4"
8 to 12"	7/8"

- C. Trapeze Suspension: Super-Strut, Elcen, or equal, 1-5/8" width channel in accordance with manufacturer's published load ratings. No deflection to exceed 1/180 of a span.
- D. Trapeze Supporting Rods: Shall have a safety factor of 5, securely anchor to building structure.

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- E. Pipe Straps: Super-Strut C-702, Speed Strut #650, or equal through 8" for ferrous pipe; C-701, Speed Strut #751, or equal, through 6" for copper pipe.
- F. Concrete Inserts: Uni-Strut P-3200 continuous insert or M24 spot insert.
- G. Pipe Rollers: Super-Strut C-728 up to 8"; C-721 for 10" and 12".
- H. Above Roof: H frame made from Uni-Strut hot-dipped galvanized 1-5/8" single or double channel with P-2072A or P-2073A foot secured to roof and surrounded with waterproof pitch pocket.
- I. Steel Connectors: Beam clamps with retainers.
- J. Wood Connectors: Angle clips with through bolts in shear; no lag screws in tension.

2.06 SERVICE MARKERS:

- A. 4" round by 30" long concrete marker, Haley Mfg., Co., Pinkerton, or equal with engraved brass identification plate.

2.07 PIPE PROTECTION:

- A. Polyethylene Coating: Extruded polyethylene coating, X-Tru-Coat, or field wrap as in B, Raychem "Thermofit" polyethylene sleeve joints, or field wrap as in B.
- B. Tape Wrap: Pressure sensitive polyvinyl chloride tape, "Trantex #V-10 or V-20", "Scotchrap #50", Slipknot 100, or equal, with continuous identification. Tape shall be a minimum of 20 mils thick for fittings and irregular surfaces, 2 wraps, 50% overlap, 40 mils total thickness. Tape shall be laminated with a suitable adhesive. Widths as recommended by the manufacturer for the pipe size. Wrap 50'-0" or longer sections of piping with an approved wrapping machine.
- C. Pabco Wrap: Pabco Specifications #D-40-240K double wrap, in accordance with manufacturer's recommendations or PVC as in B. Lap pipe wrap a minimum of 1/4" and stagger the second layer. All Pabco pipe wrapping shall be done by the manufacturer's agent and not by the Contractor, except the field joints.
- D. Field Joints and Fittings: Pabco double wrap and Polyvinyl Chloride type as above. Provide at least 2 thicknesses of tape over the joint and extend a minimum of 4" over adjacent pipe covering. Build up with primer to match adjacent covering thickness. Width of tape on fittings shall not exceed 2". Tape shall adhere tightly to all surfaces of the fittings, without air pockets.

- 2.08 ACCESS DOORS:** Milcor, Newman, or equal, with concealed hinges, screwdriver locks, prime coated with rust inhibitive paint, and style of door to suit ceiling or wall construction. Access doors in acoustical tile ceilings shall be "Sesame" with tile recess. Doors shall be 14 gage C.R. steel and shall be 22" x 30", 24" x 24" in tile ceiling, unless otherwise noted or required, fire rated to match rating of surface in which installed. Doors in walls of toilet rooms, shall be stainless steel.

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- 2.09 FLASHING: All flashings shall be made of four pound sheet lead with 8" minimum skirt, Semco S1100-2 or S1100-4, Stoneman #1110-2 or 1110-4, or equal, and counter flashing.

PART 3 - EXECUTION

3.01 ELECTRICAL REQUIREMENTS:

- A. Provide adequate working space around electrical equipment in compliance with the California Electric Code. Coordinate Mechanical Work with Electrical Work to comply.
- B. Furnish and set in place all motors. Furnish necessary control diagrams and instructions for controls. Before permitting operation of any equipment which is furnished, installed or modified under this section, review all associated electrical work including overload protection devices and assume complete responsibility for correctness of electrical connections and protective devices.
- C. Motors and control equipment shall conform to Standards of National Electrical Manufacturer's Association. All equipment and connections exposed to the weather shall be NEMA IIR with factory wired strip heaters in each starter enclosure, and temperature control panel to inhibit condensation.
- D. All power wiring, conduit, fuses, thermal overloads, and disconnect switches, and connection of all motors are under electrical work, Division 16. All wiring and conduit associated with the temperature control and indicating system is included in this section. Run all wiring in conduit in accordance with Division 16.
- E. Electric Motors: All motors shall be rated for continuous operation at 115% of nameplate amperage throughout the entire operating cycle. Motors found exceeding the nameplate amperage shall be promptly replaced at not cost to the Owner. Horsepowers shown are minimum and shall be increased as necessary to comply with above requirements.
- F. Motor Starters: Furnish magnetic motor starter for all equipment furnished under this section except those shown in motor control centers.
- G. Provide OSHA label indicating device starts automatically.

3.02 PRIMING AND PAINTING:

- A. Perform all priming and painting on the equipment and materials as specified herein.
- B. Priming: Exposed ferrous metals, including piping, which are not galvanized or factory finished shall be primed. Black steel pipe exposed to the weather shall be painted one coat of Rust-Oleum #769 primer and one coat of #960 primer. Items to be primed shall be properly cleaned by effective means, free of rust, dirt, scale, grease, wax and other deleterious matter. Any abrasion or other damage

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to the shop or field prime coat shall be properly repaired and touched up with the same material used for the original priming.

C. Finish Painting:

1. Equipment and machinery located in fan rooms, equipment rooms and similar purpose rooms and at other locations when specified, shall be furnished with a standard factory-applied beaked enamel finish in approved uniform colors. At the Contractor's option, equipment and machinery may be field-painted hereunder with two coats consisting of an air-dried synthetic industrial enamel undercoater and enamel as approved over the shop or factory-applied primer. All exposed ferrous metals, including piping located in fan rooms, equipment rooms, and boiler rooms shall be painted one coat of an approved paint, of color selected, over the primer. Canvas insulation jackets, including piping located in fan rooms, equipment rooms, and boiler rooms shall be painted two coats of paint of color selected. Mechanical Work, except as described herein, occurring in rooms or spaces required to be painted on walls, and/or ceilings will be finish painted as described above for equipment and machinery in equipment rooms.

D. See Painting Section for detail requirements and finishes.

3.03 EXCAVATING:

- A. Perform all excavating required for work of this section.
- B. Unless shown otherwise, provide a minimum of 3'-0" above top of pipe to finished grade outside so as to be below frost line and a minimum of 1'-0" under building from bottom of slab. Trim trench bottom by hand or provide a 4" deep minimum bed of sand to provide a uniform grade and firm support throughout entire length of pipe. For cement asbestos pipe, insulated pipe, glass pipe, or plastic pipe, bed the pipe in sand.
- C. Maintain all warning signs, barricades, flares and red lanterns as required.
- D. For all trenches 5' or more in depth, shoring, bracing, slipping or other provisions shall be made for worker protection from the hazard of caving ground during the excavation of such trenches in accordance with Cal OSHA.

3.04 BACKFILLING:

- A. Backfill shall comply with applicable compaction provisions of Division 2 of these specifications.
- B. Backfill plastic pipe and insulated pipe with sand for a minimum distance of 12" above the top of the pipe. Compact sand backfill by impact tamper and concrete vibrator.
- C. Except under existing or proposed paved area, walks, roads, or similar surfaces, and in cases where rock is encountered, backfill more than 1'-0" above the top of the pipe shall be made using suitable excavated material or other approved

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material as necessary. Place the backfill in 8" layers, measured before compaction, and compact with impact hammer to at least 95% relative compaction per ASTM D1557.

- D. Entire backfill for excavations under existing or proposed pavements, walks, roads, or similar surfaces, under new slabs on grade and where rock is encountered, shall be made with clean sand compacted with mechanical tamping equipment to at least 95% relative compaction per ASTM D1557. Remove excess earth from site or deposit on site if so directed by the Architect.
- E. Replace or repair to its original condition all sod, concrete, asphalt paving, or other materials, including landscape sprinklers, disturbed by the trenching operation. Repair within the guarantee period as required.

3.05 THRUST BLOCKS:

- A. Provide concrete anchors or thrust blocks on all cast iron and cement asbestos water and forced main sewer lines in the ground. Install thrust blocks at all changes in direction and at all connections to the mains 2" and larger. Form thrust blocks by pouring concrete between the pipes and trench wall. They shall be adequate in size and placed to take all thrusts created by the maximum internal water pressure.

3.06 INSTALLATION OF PIPING SYSTEMS:

A. General:

- 1. All piping shall be concealed unless shown or otherwise directed.
- 2. Where piping or conduit is left exposed within a room, the same shall be run true to plumb, horizontal or intended planes. Where possible, uniform margins are to be maintained between parallel lines and/or adjacent wall, floor or ceiling surfaces.
- 3. Horizontal runs of pipes and/or electrical conduit suspended from ceilings shall provide for a maximum headroom clearance. The clearance shall not be less than 6'-8" without written approval from the Architect.
- 4. Minor changes in locations of equipment, piping, ducts, etc., from locations shown shall be made when directed by the Architect at no additional cost to the Owner providing such change is ordered before such items of work, or work directly connected to same are installed and providing no additional material is required.
- 5. Grade all water-circulating piping, flow and return, to provide for drainage of lines and elimination of air.
- 6. Close ends of pipe immediately after installation. Leave closure in place until removal is necessary for completion of installation.
- 7. Each piping system shall be thoroughly flushed and proved clean before connection to equipment.

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8. Pipe the discharge of each relief valve, air vent, backflow preventer and similar device to floor sink or drain.
9. Install exposed polished or enameled connections with special care showing no tool marks or threads at fittings.
10. Tracer Wires (for Non-Metallic Pipe):
 - a. Install tracer wire where shown for non-metallic pipe in ground outside of buildings. Use AWG #12 tracer wire and lay continuously below vertical projection of pipe so that it is not broken or stressed by backfilling operations. Solder all joints.
 - b. Locate terminals where shown. Terminals: Precast concrete box and cast iron locking traffic cover, Brooks 3TL, or equal; cover marked with name of service; 6" of loose gravel below box. Plastic terminal board with brass bolts; identify line direction with plastic tags. Test for continuity between terminals after backfilling in presence of Construction Supervisor.
 - c. Option: Use electronically detectable plastic tape with metallic core, Terra Tape D, manufactured by Griffolyn Co., or equal; tape 2" wide, continuously imprinted "CAUTION, WATER (GAS, etc.) LINE BELOW". Install, with printed side up, directly over pipe, 8" below finish grade. Backfill material shall be as previously specified for the particular condition where pipe is installed, but avoid use of crushed rock or of earth with particles larger than 1/2" within the top 12" or backfill. Take precautions to insure that tape is not damaged or misplaced during backfill operations. Terminal boxes not required.
11. Use reducing fittings; bushings shall not be allowed. Use eccentric reducing fittings wherever necessary to provide free drainage of lines and passage of air.
 - B. Sleeves: Install AMI sleeves of sufficient size to allow for free motion of pipe, 24 gage galvanized steel. The space between pipe and sleeves through floor slabs on ground, through outside wall above or below grade, through roof, and other locations as directed shall be caulked with oakum and mastic and made watertight. At Contractor's option pipes through slabs on grade may be wrapped with 1" thick fiberglass insulation to completely isolate the pipe from the concrete in lieu of sleeves. Link seal casings may be used in lieu of caulking.
 - C. Floor, Wall and Ceiling Plates: Fit all pipe with or without insulation passing through walls, floors, or ceilings, and all hanger rods penetrating finished ceilings with chrome plated or stainless steel plates. Openings through air plenums shall be sealed airtight.
 - D. Flashing: Furnish and install around each pipe, where it passes through a roof, a flashing and counterflashing.

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E. Hangers and Supports:

1. General: Support all piping so that it is firmly held in place by approved iron hangers and supports and special hangers as required. Rigidly fasten hose faucets, fixture stops, and similar items to the building construction. All hanger material shall be approved by the Architect before installation. Support no piping or ductwork by any plumbers tape, wire, rope, wood, or other makeshift devices.
2. Pipe Support and Hanger Spacing Schedule: as shown on the plans.
3. On insulated pipes, install the hangers on the outside of the pipe covering and not in contact with the pipe. Provide rigid insulation and a 12" long, 18 gage galvanized sheet iron shield between the hanger whenever hangers are installed on the outside of the pipe covering.
4. Burning or welding on any structural member may only be done if approved by the Architect.
5. Insulate copper tubing from ferrous materials and hangers with 2" thickness of 3" wide 10 mil polyvinyl tape wrapped around pipe.
6. No valve or piece of equipment shall be used to support the weight of any pipe.
7. Provide a support or hanger close to each change of direction of pipe either horizontal or vertical.

F. Anchors:

1. Piping subject to expansion or contraction shall be provided with anchors and expansion loops or joints as required. Provide adequate guides to prevent misalignment.

G. Fireproofing:

1. The annular space between the pipe sleeves and the pipe and between duct openings and ducts through all floors and walls shall be protected by a UL-listed Fire Stopping System, 3M, Fire Barrier, Dow Firestop or Nelson Firestop.

3.07 SERVICE MARKERS:

- A. Mark the location of each plugged or capped pipe, set marker in 6" x 6" concrete pad flush with finish grade.

3.08 PIPE JOINTS AND CONNECTIONS:

- A. Cutting: Cut piping and tubing square, ream cut ends to full bore, remove rough edges, burrs, loose materials.

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- B. Threaded Pipe: Make joints with Rectorseal #5 or Permatex #1 thread lubricant or joint tape. Use no caulking of any kind. Remake leaky joints with new materials.
- C. Copper and Brass Pipe and Tubing (except Control Piping): Make all joints with silver brazing alloy, Sil-Fos or equal, 1100 degrees F. melting point or greater, ASTM B-260, except that water piping 1-1/4" and smaller not buried in the ground or concrete and Type DWV plumbing piping may be made up with 95-5 tin-antimony, ASTM B-32, Grade 5A solder. Boss or saddle type fittings or mechanically extracted tube joints will not be allowed. Use leadless solder for potable water piping.
- D. Welded Pipe:
1. Make up with oxyacetylene or electric arc process.
 2. All welding shall conform to the American Standard Code for Pressure Piping ASA B-31, Section 6, Chapter 4, and Appendix A. When requested by the Architect, furnish certification from an approved testing agency or National Certified Pipe Welding Bureau that the welders performing the work are qualified.
 3. All line welds shall be of the single "V" butt type. Welds for flanges shall be of fillet type.
 4. Where the branch is 2 pipe sizes smaller than the main or smaller, Bonney Weldolets, Thredolets, Nibco, or equal, may be used in lieu of welding tees.
- E. Cast Iron Soil Pipe:
1. Make-No Hub joints with torque wrench. Wrought iron, steel, or copper pipe shall have a ring or part of a coupling screwed on to form a spigot end where connected to a No-Hub joint. Suspended No-Hub pipe shall have sway brace at 20'-0" maximum spacing.
 2. Ty-Seal, Dual-Tite, or equal, pipe and fittings may be used at the Contractor's option.
 3. Connect building drain piping to outside service pipe with reducers or increasers as required. Caulking of smaller pipe into the larger without a reducer or increaser will not be permitted. Provide for changes in material types.

3.09 UNIONS AND FLANGES:

- A. Install EpcO, or equal, dielectric unions or flanges at points of connection between copper or brass piping material and steel or cast iron pipe or material except in drain, waste, vent, or rainwater piping. Bushings or couplings shall not be used. Dielectric unions shall not be installed below grade.

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- B. Install unions, whether shown or not, at each connection to all equipment and tanks, at one connection to each valve or cock, and at all connections to all automatic valves, such as temperature control valves.
- C. Locate the unions for easy removal of the equipment, tank or valve.

3.10 PIPE PROTECTION:

- A. Wrap all underground bare galvanized and black steel pipe and copper pipe, buried in the ground and to 6" above grade, including piping in conduit, with a corrosive protective wrap as specified under "Pipe Protection" in Part 2 of Section 22 40 00.
- B. Cleaning: Clean all piping thoroughly before wrapping.
- C. Inspection: Damaged or defective wraps shall be repaired as directed. No wrapped pipe shall be covered until approved by the Architect.
- D. Testing: Test completed piping with Tinker and Razor Co. test machine (San Gabriel, Calif. 626/287-7942).
- E. Covering: No rocks or sharp edges shall be backfilled against the wrap. when backfilling with other than sand, protect wrap with an outer wrapping of Kraft paper. Leave in place during backfill.

3.11 ACCESS DOORS:

- A. Furnish and install access doors wherever required whether shown or not for easy maintenance of mechanical system; for example, at concealed valves, strainer, traps, cleanouts, dampers, motors, controls, operating equipment, etc. Access doors shall provide for complete removal and replacement of equipment.

3.12 CONCRETE WORK:

- A. Concrete work required for work of this section shall be included under another section of the specifications, unless otherwise noted. This shall include all poured in place concrete work for installing precast manholes, catch basins, etc., unless the work is specifically indicated on the drawings to be furnished under this section. Thrust blocks, underground anchors, and pads for cleanouts, valve access boxes and washer boxes are included under this section of the specification. Concrete shall be 2500 psi test minimum.

3.13 INSULATION WORK:

- A. General:
 - 1. All insulation shall be done by a contractor specifically licensed for insulation work. Insulation applied by the mechanical and plumbing contractor is not acceptable.
 - 2. The term "piping" used herein shall include pipe, air separators, valves, strainers and fittings. Apply insulating cement to fittings, valves and strainers and trowel smooth to the thickness of adjacent covering. Cover with jacket to match piping. Extend covering on valves up to the bonnet.

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Leave strainer cleanout plugs accessible. Valve and fitting covers may be preformed PVC. Provide rigid insulation, 18" minimum length at each pipe hanger. Seal ends of insulation with jacket.

3. Do not insulate flanges and unions on high temperature piping. Insulate unions and pump bodies on chilled water and combination hot and chilled water systems with three heavy layers of Mortell's No-Drip Paint, 1/16" minimum total thickness or Armstrong Armaflex Tape per manufacturer's recommendations.
4. Clean thoroughly, test, and have approved, all piping and equipment before installing covering.
5. All insulation, adhesive coverings and jackets including pre-insulated flexible ductwork shall have a flame spread of 25 or less and developed smoke rating of 50 or less tested in accordance with ASTM E84.

B. Insulation of Piping:

1. Domestic hot and tempered water shall be insulated as shown on the plans.
2. Urethane insulation will not be allowed above ground or on hot water or steam piping.
3. On all insulated piping exposed to the weather apply .015 aluminum jacket secured with 1/2" aluminum bands on 12" centers. Cover fittings with six ounce canvas and two coats of Foster's 30-36 or Zeston plastic fitting covers. Insulation shall be vaportight before applying metal jacket or plastic covers.
4. All insulated piping exposed in occupied spaces or mechanical rooms shall have a Proto or equal, 25/50 rated PVC jacket. Color as selected, installed and sealed per manufacturer's recommendations.
5. Refrigerant piping, including all fittings, shall be insulated with nominal 3/4" thick Armstrong Armaflex 22, Owens-Corning Flex Tubing, or equal. Seal all joints with Armstrong 520 adhesive, Owens-Corning 500 adhesive, or equal. Insulation exposed to the weather shall be finished with two coats of Armstrong white Armaflex finish, or equal. Apply insulation in strict accordance with manufacturer's recommendations.

C. Duct Insulation:

1. Wrap all unlined concealed supply and return ducts with O.C. Fiberglas All-Service duct wrap with a reinforced foil Kraft vapor barrier facing 2" thick and 3/4# per cubic foot density. Wrap insulation entirely around duct and wire securely in place with #16 wire 12" o.c. and each side of each standing seam and over each insulation joint. Lap all insulation joints 3" minimum. Insulate ducts installed tight against other work before hanging in place.

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2. All ducts and plenums in Fan Room shall be insulated with 1-1/2" (2" outside building) thick Fiberglas 705 insulating board with factory-applied foil facing. Insulation shall be adhered to ducts with Type B STICKLIPS at 18" o.c. cemented in place. Wrap insulation with 8 ounce canvas sized with Foster's Seal-fas mastic. Apply one final undiluted coating of Foster's 30-76 white insulation coating.
3. Install acoustical lining in all supply, return and mixed air ducts and plenums exposed in the Equipment Room or outside the building and where marked; and additional length as necessary to provide, in all cases, a minimum of 10'-0" in each direction from the fan, fan casing, or unit casing. Line exhaust ducts for a minimum of 10'-0" from fan inlet and 10'-0" downstream from each register or grille. Line all transfer ducts. Lining shall be 1" thick vinyl face black matt Fiberglas Aeroflex Type 150, 1-1/2# per cubic foot, J-M, or equal. Cement the lining in place with 100% coverage of Foster's 85-20, 3M #38, or equal, and coat all edges and joints. In addition, all lining shall be fastened with Sticklips or welded pins spaced at 18" maximum centers both ways. No bare fiberglass shall be left exposed to air stream.
4. Seal airtight all seams of all supply, return and exhaust ducts except those exposed in the conditioned space with Hardcast Inc. FTA-20 adhesive and Hardcast DT-Tape installed in accordance with manufacturer's directions.
5. Seal watertight all joints of all ductwork exposed to the weather with 6 ounce canvas dipped in Arabol; cover the canvas with a heavy coat of Foster's 30-76, or equal, no dilution.

3.14 EQUIPMENT IDENTIFICATION:

- A. Identify each piece of equipment with an engraved brass tag fastened with screws. For example – FAN COIL 1.

3.15 PIPE IDENTIFICATION:

- A. Identify each piping system and indicate the direction of flow by means of Idento Bands (Idento Metal Products Co.) or SETMARK pipe markers. Apply the markings after all painting and cleaning of the piping and insulation is completed.
- B. Apply the legend and flow arrow at all valve locations; at all points where the piping enters or leaves a wall, partition, cluster of piping or similar obstruction; and at approximately 50'-0" intervals on pipe runs. Variations or changes in locations and spacing may be made with the approval of the Architect. There shall be at least one marking in each room. Markings shall be located for maximum visibility from expected personnel approach.
- C. Wherever two or more pipes run parallel, the markings shall be supplied in the same relative location on each.
- D. The legends and flow arrows shall conform to ANSI A13.1.

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E. The sizes of the letter and flow arrows shall be as follows:

<u>Outside Diameter of Pipe or Covering (Inclusive)</u>	<u>Size of Letter</u>	<u>Minimum Length of Flow Arrow</u>
5/8" to 2"	1/2"	2-1/2"
2-1/2" and Larger	1"	4"

F. Each hand valve on non-potable water piping shall be labeled with a metal tag stamped "DANGER -- NON-POTABLE WATER" in one-quarter inch (1/4") high letters.

3.16 GUARDS:

- A. General: Belt drive, gear drive shafts, couplings, fan inlets and outlets, and running equipment shall be properly protected by guards as required by the CCR, Title 8, Division of Industrial Safety, Sub Chapter 7, General Industry Safety Orders, Articles 31 through 36, whether shown on the drawings or not.
- B. Construction: Guards shall be factory furnished or made of expanded metal with angle iron framework. Guards for belt drives shall have an easily removable section for replacement of belts. Openings shall be provided at shaft ends for taking rpm readings.

3.17 ANTI-VIBRATION BASES AND HANGERS:

- A. All ventilating and air conditioning equipment shall operate under continuous demand without objectionable vibration. Contractor shall be sure that above result is achieved. Isolate all equipment connections, including conduit, piping, drains, etc.
- B. Air conditioning units and all fans shall be supported on anti-vibration bases or hangers. Other equipment and pumps shall be supported on anti-vibration bases, pads or hangers, when shown on Drawings or specified with equipment. Isolators and supporting bases shall be supplied by single manufacturer, Kinetics, Korfund, or equal. Type of mounting and supporting base for each piece of equipment shall be as tabulated on equipment schedule or as hereinafter specified. Individual mounts shall be Kinetics Type FPS, or equal. Contractor shall provide calculations for isolators and mounting acceptable to reviewing authority.
- C. All piping in Mechanical Equipment Rooms and piping three supports away from mechanical equipment mounted on vibration isolators shall be isolated from structure by means of vibration and noise isolators. Suspended piping shall be isolated with combination Spring and Fiberglass hangers in supporting rods. Hangers shall be Type H. Floor-mounted piping shall be supported directly on Spring Mounts, Type S. Vertical pipe risers shall be isolated from structure by means of vibration and noise isolating Expansion Hangers, Type XH.

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- D. Isolator manufacturer's submittal shall include complete design for supplementary bases, tabulation of design data on isolators, including O.D. free operating, and solid heights of springs, free and operating heights of neoprene or fiberglass isolators, and isolation efficiency based on lowest operating speed of equipment supported.

3.18 SPECIAL SEISMIC REQUIREMENTS:

- A. Supports for all piping and ductwork shall be in accordance with SMACNA "Guidelines for Seismic Restraints of Mechanical Systems and Plumbing Piping Systems".
- B. Expansion Anchors in Hardened Concrete:
 - 1. Maximum Values: The allowable shear and withdrawal shall not exceed values permitted for bolts cast into concrete, as defined in Section 2624 of Title 24, with the 100% increase provided in Footnote 1 to CCR Table 26-F.
 - 2. Qualification Tests: The allowable shear and withdrawal load shall be based on qualification tests of at least three (3) test specimens, using a factor of safety of five (5) on the average of the test values, or a factor of safety of four (4) on the lowest test value, whichever is lower. Until the test data for the various anchors can be evaluated, use not more than 80% of the allowable load listed in the ICBO Research Committee Recommendations for the specific anchor.
 - 3. Installation: The anchors must be installed in accordance with the requirements given in ICBO Research Committee Recommendations for the specific anchor.
 - 4. Limitations on Anchors in Withdrawal: Anchors acting in withdrawal shall not be used for major connections such as anchoring tilt-up walls, tie-downs, heavy continuously applied loads, frequent vibratory loads, etc.
 - 5. Job Testing: Fifty percent of the anchors shall be load-tested on each job to twice the allowable capacity in tension, except that if the design load is less than 75 pounds; only one anchor in ten need be tested. If any anchor fails, all anchors must be tested. The load test shall be performed in the presence of the project inspector.

The load may be applied by any method that will effectively measure the tension in the anchor, such as direct pull with a hydraulic jack, a torque wrench calibrated using the specific anchor, calibrated spring-loading devices, etc. Anchors in which the torque is used to expand the anchor without applying tension to the bolt may not be verified with a torque wrench.

3.19 TESTS AND ADJUSTMENTS:

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- A. Test the installation in accordance with the following requirements and all applicable codes. Notify the Architect at least 7 days in advance of any test. All piping shall be tested at completion of roughing-in, or at other times as directed by the Architect.
- B. Furnish all necessary materials, test pumps, gases, instruments and labor required for testing. Tests shall be witnessed by the Architect.
- C. Isolate from the system all equipment which may be damaged by test pressure.
- D. Test Schedule: No loss in pressure or visible leaks shall show after four hours at the pressures indicated.

<u>System Tested</u>	<u>Test Pressure PSI</u>	<u>Test With</u>
Sanitary Sewer, Drain, Vent	10 Ft. Hd.	Water
Storm Drain, Condensate Drains	10 Ft. Hd.	Water
Domestic Hot and Cold Water	125	Water
Gases	100	Air & Soap

All piping, including underground, connected to the fire sprinkler system shall be tested and certified in accordance with ISO requirements.

- E. Testing, Evacuating, Charging and Lubrication of Refrigeration Systems:
 - 1. Pressurize with dry nitrogen and/or refrigerant to 300 psig and test all joints with an electronic detector or halide torch. Release the pressure and attach a high vacuum pump. Evacuate to 4mm (4000 microns) and hold for 30 minutes. Break to 5 psig with dry nitrogen or R-22 and allow to remain in the system for ten minutes. Evacuate to 2mm (2000 microns) and hold for 30 minutes. Use a mercury manometer or electronic vacuum gauge. Do not start timing until recommended vacuum range is reached.
 - 2. At the end of the evacuation, if the system has been proved leakfree, charge with refrigerant and fill the crankcase to the oil level specified by the manufacturer. All refrigerant oil shall be delivered to the location in sealed containers.
 - 3. Replenish for a period of one year without cost to the Owner all refrigerant and oil required to maintain the proper levels.
- F. Perform operational tests under simulated or actual service conditions, including one test of complete plumbing installation with all fixtures and other appliances connected.

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- G. Should any material or work fail in any of these tests, it shall be immediately removed and replaced by new material, any portion of the work replaced shall again be tested by Contractor at his own expense.
- H. Instruct Owner's operating personnel during test and operating adjustment period. Lubricate each item of equipment, including motors, before operation.

3.20 MISCELLANEOUS FRAMES AND COVERS:

- A. Furnish all steel channel frames and covers in connection with concrete work required by this Section of the Specification. All items shall be welded construction, and except as noted, hot-dip galvanized after fabrication painted two coats of chromate before delivering to the jobsite.

END OF SECTION 22 05 00

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SECTION 22 44 00

PLUMBING

PART 1 - GENERAL

1.1 SCOPE:

Provide plumbing where shown on the Drawings, as specified herein, and as needed for a complete and proper installation including, but not necessarily limited to:

- A. Domestic hot and cold water piping systems
- B. Drain, waste, and vent systems
- C. Gas, water and sewer service connections per local requirements
- D. Plumbing fixtures and trim as shown on the Drawings
- E. Condensate lines

1.2 General Contractor shall provide temporary sanitary facilities for all trades.

1.3 DRAWINGS:

- A. Examine all drawings prior to starting of work and report any discrepancies in writing to the Architect.
- B. Verify all dimensions at the building site and check existing conditions before beginning work. Make changes which are necessary to install the work in harmony with other crafts; they shall be first approved by the Architect.
- C. Execute work mentioned in the specifications and not shown on the drawings, or vice versa, the same as if specifically mentioned in both.
- D. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.4 CODES AND REGULATIONS:

- A. Provide all work and materials in full accordance with the latest rules and regulations of the:
 - 1. 2019 California Building Code
 - 2. 2019 California Plumbing Code
 - 3. 2019 California Mechanical Code
 - 4. 2019 California Electrical Code

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5. 2019 California Fire Code
6. Title 24, California Code of Regulations.

Nothing in these plans or specifications is to be construed to permit work not conforming to these codes. Furnish without extra charge, any additional material and labor required to comply with these rules and regulations.

1.5 SUBSTITUTIONS AND MATERIALS LIST:

- A. Product names are used as qualitative standards, however other materials or methods shall not be used unless approved in writing by the architect. The burden of proof as to the equality of any proposed material shall be upon the contractor, and the architect's decision is final. Only one request for substitution shall be considered for each item. Equipment capacities specified are minimum acceptable.
- B. Submit in indexed folders, five (5) sets of submittals for approval within 35 days after the award of the contract. The submittals shall be accompanied by equipment shop drawings, pump performance curves, and other pertinent data, showing the size, capacity and the proposed materials to be used. Submittals shall be provided, whether substitutions are made or not, and shall be listed in the order in which they appear in the schedules. Submittals shall be provided and approved prior to start of construction.
- C. Any mechanical, electrical, structural or other changes required for the installation of any substituted equipment shall be made to the satisfaction of the architect and without additional cost to the owner. Approval by the architect of the substituted equipment and/or dimensional drawings does not waive these requirements. With submittal, provide drawings showing substituted equipment.
- D. Approval of material shall not be construed as authorizing any deviations from the specifications unless the attention of the architect has been directed to the specific deviations.
- E. Furnish to the Inspector, upon request, complete installation shop drawings of the same approved substitutions and drawings.

1.6 STERILIZATION CERTIFICATE: Upon completion of water line sterilization, deliver to the Architect two copies of an acceptable "Certificate of Performance" for that activity.

1.7 MANUALS:

- A. Upon completion of the work of this Section, deliver to the Architect one copy of an operation and maintenance manual compiled in accordance with the provisions of the General Requirements.
- B. Include within each manual a copy of the Project Record Documents showing all work of this Section.

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- 1.8 FIELD MEASUREMENT: Make necessary measurements in the field to assure precise fit of items included in plumbing. Verify dimensions with all framing and concrete work prior to installing any components. Notify architect immediately of any discrepancies.
- 1.9 Install fixtures for accessibility requirements at locations shown on plans.

PART 2 - MATERIALS

- 2.1 FIXTURE SCHEDULE (As shown on Plumbing Drawings – see PLUMBING FIXTURE SCHEDULE)
- 2.2 PIPE SCHEDULE (As shown on Plumbing Drawings – see PLUMBING MATERIAL SPECIFICATIONS)
- 2.3 MISCELLANEOUS MATERIALS:
- A. Gate valves: Provide solid wedge disc, rising stem, WOG; rising stem: Provide Nibco T-126 bronze, screwed, or 5-126, solder.
 - B. Globe valves: Provide replaceable composition disc suitable for 200 degree F water: 2 1/2 and smaller; Provide Nibco F-718-B, bronze, screwed.
 - C. Gas cocks: 2" and smaller: Provide 250#, bronze, screwed, square head, 125# (Rockwell Fig 142).
 - D. Ball valves: two or three piece construction, forged bronze body, chrome plated brass ball, threaded ends, Teflon seats, PTFE or reinforced Teflon stem seals, lever handles. Milwaukee BA100/150, BA300/350.
 - E. Flashing: Where pipes of this Section pass through the roof, flash with 24 ga. galvanized sheet metal, counter flashing to be 24 ga. sheet metal.
 - F. Traps for lavatories and sinks, except service sinks, chrome plated 17-ga. brass with clean out.
 - G. Insulation:
 - 1. Provide 1-1/2" thick, 3 ½ pound per cubic foot fiberglass with all-service jacket (aluminum jacket with stainless steel bands outdoors) for all hot water and hot water returns (service at 105-140 F up to 4" diameter).
 - 2. Pipe wrapping
 - a. Steel piping in concrete or underground:
 - (1) Wrap with 20 mil tape.
 - (2) Fittings and other joints: Wrap in the field with 20 mil tape and primer.

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- (3) Provide 50% overlap on tape weld rubber coating.
- b. Sleeves: Where pipes pass through concrete, masonry, or stud walls, or pass through ceilings, provide a sleeve of the size required.
- H. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.
- I. Fixtures and Equipment: Provide complete plumbing fixture, trim, and equipment where shown on the Drawings.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS:

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

3.2 PLUMBING SYSTEM LAYOUT:

- A. Lay out the plumbing system in careful coordination with the Drawings, determining proper elevations for all components of the system and using only a minimum number of bends to produce a satisfactorily functioning system.
- B. Follow the general layout shown on the Drawings in all cases except where other work may interfere.
- C. Lay out pipes to fall within partition, wall, or roof cavities, and to not require furring other than as shown on the Drawings.

3.3 Perform trenching and backfilling associated with the work of this Section in strict accordance with all provisions of these Specifications.

- A. Cut bottom of trenches to grade. Make trenches 12" wider than the greatest dimension of the pipe.
- B. Bedding and backfilling:
 - 1. Install piping promptly after trenching. Keep trenches open as short a time as practicable.
 - 2. Under the building, install pipes on a 6" bed of damp sand. Backfill to bottom of slab with damp sand.
 - 3. Outside the building, install underground piping on a 6" bed of damp sand. Backfill to within 12" of finish grade with damp sand. Backfill remainder with native soil.

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4. Do not backfill until installation has been approved and until Project Record Documents have been properly annotated.

3.4 INSTALLATION OF PIPING AND EQUIPMENT

A. General:

1. Proceed as rapidly as the building construction will permit.
2. Thoroughly clean items before installation. Cap pipe openings to exclude dirt until fixtures are installed and final connections have been made.
3. Cut pipe accurately, and work into place without springing or forcing, properly clearing windows, doors, and other openings. Excessive cutting or other weakening of the building will not be permitted.
4. Show no tool marks or threads on exposed plated, polished, or enameled connections from fixtures. Tape all finished surfaces to prevent damage during construction.
5. Make changes in directions with fittings; make changes in main sizes with eccentric reducing fittings. Unless otherwise noted, install water supply piping with tap tees feeding up to fixtures.
6. Run horizontal sanitary and storm drainage piping at a uniform grade of 1/4" per ft, unless otherwise noted. Run horizontal water piping with an adequate pitch upwards indirection of flow to allow complete drainage.
7. Provide sufficient swing joint, ball joints, expansion loops, and devices necessary for a flexible piping system, whether or not shown on the Drawings.
8. Support piping independently at pumps, coils, tanks, and similar locations, so that weight or pipe will not be supported by the equipment.
9. Pipe the drains from pump glands, drip pans, relief valves, air vents, and similar locations, to spill over an open sight drain, floor drain, or other acceptable discharge point, and terminate with a plain end unthreaded pipe 2" above the drain.
10. Securely bolt all equipment, isolators, hangers, and similar items in place.
11. Support each item independently from other pipes. Do not use wire for hanging or strapping pipes.
12. Provide complete dielectric isolation between ferrous and non-ferrous metals.

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13. Provide union and shut off valves suitably located to facilitate maintenance and removal of equipment and apparatus, whether shown or not.
14. Provide adequate drainage slope on condensate drains.
15. Equipment access:
 - a. Install piping, equipment, and accessories to permit access for maintenance. Relocate items as necessary to provide such access, and without additional cost to the Owner.
 - b. Provide access doors where valves, water hammer arrestors, motors, or equipment requiring access for maintenance are located in walls or chases or above ceilings. Coordinate location of access doors with other trades as required.

B. Pipe Joints

1. Copper tubing:
 - a. Cut square, remove burrs, and clean inside of female fitting to a bright finish.
 - (1) Apply solder flux with brush to tubing.
 - (2) Remove internal parts of solder-end valves prior to soldering.
 - b. Provide dielectric unions at points of connection of copper tubing to ferrous piping and equipment.
 - c. For joining copper tubing, use:
 - (1) Water piping 3" and smaller: "Lead free" solder;
 - (2) Underground: "sil-fos" brazing.
2. Screwed piping:
 - a. Deburr cuts.
 - (1) Do not ream exceeding internal diameter of the pipe.
 - (2) Thread to requirements of ANSI B2.1.
 - b. Use Teflon tape on male thread prior to joining other services.
3. Leaky joints:
 - a. Remake with new material.
 - b. Remove leaking section and/or fitting as directed.
 - c. Do not use thread cement or sealant to tighten joint.

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- J. Pipe Supports:
1. Support suspended piping with clevis or trapeze hangers and rods.
 2. Space hangers and support for horizontal steel pipes according to the plans.
 3. Space hangers and supports for horizontal copper tubing according to the plans.
 4. Provide sway bracing on hangers longer than 18".
 5. Support vertical piping with riser clamps secured to the piping and resting on the building structure. Provide at partition top plates.
 6. Provide insulation continuous through hangers and rollers. Protect insulation by galvanized steel shields.
 7. Arrange pipe supports to prevent excessive deflection, and to avoid excessive bending stress.
 8. Support piping from inserts or anchors in concrete slabs.
 9. Hubless piping:
 - a. Provide hangers on the piping at each side of, and within 6" of, hubless pipe coupling so the coupling will bear no weight.
 - b. Do not provide hangers on couplings.
 - c. Provide hangers adequate to maintain alignment and to prevent sagging of the pipe.
 - d. Make adequate provision to prevent shearing and twisting of the pipe and the joint.
- K. Sleeves and Openings
1. Provide sleeves for each pipe passing through walls, partitions, floors, roofs, and ceilings.
 - a. Set pipe sleeves in place before concrete is placed.
 - b. For uninsulated pipe, provide sleeves two pipe sizes larger than the pipe passing through, or provide a minimum of 1/2" clearance between inside and outside of the pipe.
 - c. For insulated pipe, provide sleeves of adequate size to accommodate the full thickness of pipe covering, with clearance for packing and caulking.
 2. Caulk the space between sleeve and pipe or pipe covering, using a noncombustible, permanently plastic, waterproof, non-staining compound which leaves a smooth finished appearance, or pack with noncombustible asbestos cotton, rope, or fiberglass to within

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1/2" of both wall faces, and provide the waterproof compound described above.

3. Finish and escutcheons:
 - a. Smooth up rough edges around sleeves with plaster or spackling compound.
 - b. Provide 1" wide chrome or nickel plated escutcheons on all pipes passing through walls, floors, partitions, ceilings, and similar locations.
 - (1) Size the escutcheons to fit pipe and covering.
 - (2) Hold escutcheons in place with set screw.

L. Cleanouts:

1. Secure the Architect's approval of locations for cleanouts in finished areas prior to installation.
2. Provide cleanouts of same nominal size as the pipes they serve.
3. Make cleanouts accessible. After pressure tests are made and approved, thoroughly graphite the cleanout threads.

M. Valves:

1. Provide valves in water and gas systems. Locate and arrange so as to give complete regulation of apparatus, equipment and fixtures.
2. Provide valves in at least the following locations:
 - a. In branches and/or headers of water piping serving a group of fixtures.
 - b. On both sides of apparatus and equipment.
 - c. For shutoff of risers and branch mains.
 - d. For flushing and sterilizing the system.
 - e. Where shown on the Drawings.
3. Locate valves for easy accessibility and maintenance.

N. Backflow Prevention:

1. Protect plumbing fixtures, faucets with hose connections, and other equipment having plumbing connection, against possible back-siphonage.
2. Arrange for testing of backflow devices as required by the governmental agencies having jurisdiction.

O. Plumbing Fixture Installation

1. Installation:

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- a. Set fixtures level and in proper alignment with respect to walls and floors, and with fixtures equally spaced.
 - b. Provide supplies in proper alignment with fixtures and with each other.
 - c. Provide flush valves in alignment with the fixture, without vertical or horizontal offsets.
2. Grout wall and floor mounted fixtures watertight where the fixtures are in contact with walls and floors.
 3. Caulk deck-mounted trim at the time of assembly, including fixture and casework mounted. Caulk self-rimming sinks installed in casework.
- P. Disinfection of Water Systems
1. Disinfect hot and cold water systems.
 - a. Notify the Architect at least 48 hours prior to start of the disinfection process.
 - b. Upon completion of disinfecting, secure and submit the Certificate of Performance required under Article 2a of this Section, stating system capacity, disinfectant used, time and rate of disinfectant applied and resultant residuals in ppm at completion.
 - c. Use disinfectant method approved by the California Plumbing Code.
 2. When disinfection operation is completed, and after final flushing, secure an analysis by a laboratory, based on water samples from the system, showing test negative for coli-aerogene organisms. Provide a total plate count of less than 100 bacteria per cc, or equal to the control sample.
 - a. Upon completion of disinfecting, secure and submit the Certificate of Performance required by the County Health Dept, stating system capacity, disinfectant used, time and rate of disinfectant applied and resultant residuals in ppm at completion.
 - b. Use disinfectant method approved by the Owner.
 3. If analysis results are not satisfactory, repeat the disinfection procedures and retest until specified standards are achieved.
- Q. Other Testing and Adjusting.
1. Provide personnel and equipment, and arrange for and pay the costs of, all required tests and inspections required by governmental agencies having jurisdiction.

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2. Where tests show materials or workmanship to be deficient, replace or repair as necessary, and repeat the tests until the specified standards are achieved.
3. Adjust the system to optimum standards of operation.

END OF SECTION 22 44 00

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SECTION 23 08 00

HVAC

PART 1 - GENERAL

1.1 SCOPE

Furnish and install all heating, ventilating and air conditioning work indicated on the drawings and described herein. Also, any incidental work not shown or specified that is necessary to provide the complete system.

1.2 DRAWINGS

- A. Examine all drawings prior to starting of work and report any discrepancies in writing to the Architect.
- B. Verify all dimensions at the building site and check existing conditions before beginning work. Make changes which are necessary to install the work in harmony with other crafts; they shall be first approved by the Architect.
- C. Execute work mentioned in the specifications and not shown on the drawings, or vice versa, the same as if specifically mentioned in both.

1.3 CODE RULES AND SAFETY ORDERS

- A. Provide all work and materials in full accordance with the latest rules and regulations of the:
 - 1. 2019 California Building Code
 - 2. 2019 California Plumbing Code
 - 3. 2019 California Mechanical Code
 - 4. 2019 California Electrical Code
 - 5. 2019 California Fire Code
 - 6. Title 24, California Code of Regulations.

Nothing in these plans or specifications is to be construed to permit work not conforming to these codes. Furnish without extra charge, any additional material and labor required to comply with these rules and regulations.

1.4 FEE AND PERMITS: Procure and pay for all licenses, fees and permits required.

1.5 UTILITY COORDINATION: It shall be the contractor's responsibility to arrange and coordinate with the utility companies all requests for service(s) and the installation of meter(s) and services. The contractor shall furnish all documentation and information that the utility companies require prior to start of construction. Within 35 calendar days of the award of contract, the contractor

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shall submit to the architect a letter with copies of drawings that are sent to the utility companies for such services.

- 1.6 **FRAMING, CUTTING AND PATCHING** Special framing, recesses, chases and backing for work of this section is covered under other sections. Be responsible for proper placement of all pipe sleeves, hangers and supports and location of openings for work of this section.
- 1.7 **SUBSTITUTIONS AND MATERIALS LIST**
- A. Product names are used as qualitative standards, however other materials or methods shall not be used unless approved in writing by the architect. The burden of proof as to the equality of any proposed material shall be upon the contractor, and the architect's decision is final. Only one request for substitution shall be considered for each item. Equipment capacities specified are minimum acceptable.
 - B. Submit in indexed folders, five (5) sets of submittals for approval within 35 days after the award of the contract. The submittals shall be accompanied by equipment shop drawings, pump performance curves, and other pertinent data, showing the size, capacity and the proposed materials to be used. Submittals shall be provided, whether substitutions are made or not, and shall be listed in the order in which they appear in the schedules. Submittals shall be provided and approved prior to start of construction.
 - C. Any mechanical, electrical, structural or other changes required for the installation of any substituted equipment shall be made to the satisfaction of the architect and without additional cost to the owner. Approval by the architect of the substituted equipment and/or dimensional drawings does not waive these requirements. With submittal, provide drawings showing substituted equipment.
 - D. Approval of material shall not be construed as authorizing any deviations from the specifications unless the attention of the architect has been directed to the specific deviations.
 - E. Furnish to the Inspector, upon request, complete installation shop drawings of the same approved substitutions and drawings.
- 1.8 **SITE CONDITIONS** Information on the drawings relative to existing conditions is approximate only. Deviations found necessary during progress of construction to conform to actual conditions, as approved by the architect, shall be made without additional cost to the owner. The contractor shall be held responsible for any damage caused to the existing property and services. Promptly notify the architect if services are found which are not shown on the drawings.
- 1.9 **GUARANTEE**
- A. Repair or replace any defective work, material or part which may appear within one year of the date of acceptance. This shall include damage by leaks.

SPECIAL PROVISIONS
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- B. On failure to comply with the above guarantee within a reasonable length of time, after notification is given, the architect shall have the repairs made at the contractor's expense.

1.10 MAINTENANCE AND OPERATING INSTRUCTION

- A. Furnish four complete sets of operating and maintenance instructions bound in a hardboard binder and indexed. Start compiling the data upon approval of list of materials, Final inspection will not be made until booklets are approved by the architect.
- B. These sets shall incorporate the following:
 - 1. Complete operating instructions for each item of equipment listing in detail the lubricants to be used, frequency of lubrication, inspections required, adjustments, etc.
 - 2. Manufacturer's documentation with part numbers, instructions etc., for each item of equipment.
- C. Post service telephone numbers and/or addresses in an appropriate place as designated by the architect.

1.11 RECORD DRAWINGS

- A. Upon completion of the work, and as precedent to final payment, the contractor shall provide and deliver, to the architect, updated reproducible drawings showing the work exactly as installed.

PART 2 - PRODUCTS

- 2.1 Provide equipment as specified on the drawings

PART 3 - EXECUTION

3.1 MATERIAL STORAGE

- A. During storage at the construction site, all duct and related air distribution component openings shall be covered with tape, plastic, sheetmetal or other methods acceptable to the local authority to reduce dust or debris collection in compliance with CalGreen section 5.504.3.

3.2 FILTERS

- A. Air filters shall be of an approved type tested in accordance with test method SFM Std. 12-71-1 as shown in Part 12, Title 24, California Code of Regulations. Preformed filters having combustible framing shall be tested as a complete assembly. Air filters in all occupancies shall be Class 2 or better (as shown in the State Fire Marshall listing).
- B. Provide temporary filters for all fans that are used during construction; after all construction dirt has been removed from the building, install new filters at no additional cost to the Owner.

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C. Air filters shall be accessible for cleaning or replacement.

3.3 SHEET METAL WORK

- A. Construct and install all sheet metal in accordance with the latest SMACNA recommendations. Provide variations in duct size, and additional duct fittings as required to clear obstructions and maintain clearances, as approved by the Architect, at no extra cost to the Owner. Pressure class shall be 2" w.c. or better.
- B. Exterior ductwork shall be sealed water-tight with hardcast RTA 50 adhesive and DT-tape or Glenkote.
- C. Interior ductwork shall be sealed water-tight with hardcast RTA 20 adhesive and DT-tape or Glenkote.
- D. Duct sealer system must be installed in strict conformance with the manufacturer's application instructions.
- E. Provide drive slip or equivalent flat seams for ducts where necessary due to spacer limitations. On ducts with flat seams, provide standard reinforcing inside of duct.
- F. Provide Duro-Dyne Ventlon flexible connections on inlet and outlet of each fan.
- G. Duct size shown on lined duct is the inside dimension.
- H. All round ductwork shall be metal, except fiberglass flexible duct shall be used on the final 5'-0" connection to the diffuser in concealed areas. Transitions and bends to ductwork, to avoid obstructions, must be approved by the Architect. Protect ductwork from damage during and after erection until final inspection.
- I. Flexible ducts shall conform the following requirements:
 - 1. Factory-made air ducts shall be approved for the use intended or shall conform to the requirements of U.M.C. Standard No. 6-1. Each portion of a factory-made air duct system shall be identified by the manufacturer with a label or other suitable identification indicating compliance with U.M.C. Standard No. 6-1 and its class designation. These ducts shall be listed and shall be installed in accordance with the terms of their listing.
 - 2. Flexible ducts shall consist of an exterior reinforced laminated vapor barrier, 1-1/2" thick fiber glass insulation ($K=.25 @ 75^0F$), encapsulated spring steel wire Helix and impervious, smooth, non-perforated interior vinyl liner. Individual lengths of flexible ducts shall contain factory fabricated steel connection collars.
 - 3. Flexible ducts shall be supported at or near mid-length with 2" wide 28 GA. Steel hanger collar attached to the structure with an

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approved duct hanger. Installation shall minimize sharp radius turns or offsets. The maximum length connecting to terminal outlets shall be seven feet.

4. Flexible ducts may be used to cross seismic joints without offsets.
5. Flexible air ducts shall be anchored and supported per the latest SMACNA air duct annual.

3.4 GRILLES

- A. Provide all outlets with gaskets and install so that there will be no streaking of the walls or ceiling due to leakage.
- B. Furnish all diffusers, registers, and grilles with baked enamel finish—color to be coordinated with architect—and white gaskets on ceiling-mounted outlets.
- C. All visible surfaces behind air outlet faces to be flat black.

3.5 VIBRATION ISOLATION

- A. Isolate all ventilating and air conditioning equipment, including conduit, piping, duct, drains, etc., so that equipment will operate under continuous demand without objectionable vibrations.

3.6 TESTING AND BALANCING

- A. Coordinate testing and balancing agency work with work of other trades.
- B. Contractor shall provide for adjustments and/or additions or modifications to fan and motor sheaves, belts, damper linkages and the like to achieve proper air balance at no additional cost.
- C. Testing and balancing shall be performed in complete accordance with AABC National Standards for Field Measurements and Instrumentation. Testing and balancing shall be performed on air distribution systems.
- D. Balance air quantities of supply, return, outside air, and exhaust to achieve those given on Drawings with accuracy within minus 5 percent and plus 10 percent. Measure the total air quantity at each fan.
- E. The air balance technician shall be responsible to modify all supply, return, and exhaust fan sheaves & VFD output frequency limits as applicable such that the design air flows are met. All supply fans controlled for filter loading shall similarly be modified to ensure the full range of motor power is available to the control system. Rated fan speed and motor speed shall not be exceeded.

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END OF SECTION 23 08 00

**SPECIAL PROVISIONS
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SECTION 23 11 23

NATURAL GAS PIPING

PART 1 - GENERAL

1.12 SCOPE

Furnish and install all natural gas service work indicated on the drawings and described herein. Also, any incidental work not shown or specified that is necessary to provide the complete system.

1.13 DRAWINGS

- A. Examine all drawings prior to starting of work and report any discrepancies in writing to the City's representative.
- B. Verify all dimensions at the site and check existing conditions before beginning work. Make changes which are necessary to install the work in harmony with other improvements; they shall be first approved by the City's representative.
- C. Execute work mentioned in the specifications and Appendix B of these specifications and not shown on the drawings, or vice versa, the same as if specifically mentioned in both.

1.14 REFERENCES

- A. Appendix D – PG&E Mckinley Park Gas Service Installation, Gas Service Record (GSR), Applicant Instructions, & Applicant Materials List

1.15 QUALIFICATIONS

- A. Gas service installer shall hold current PG&E certification for installation of gas line service. Contractor shall provide proof of valid and current certification.

1.16 CODE RULES AND SAFETY ORDERS

- A. Provide all work and materials in full accordance with the latest rules and regulations of the:
 - 1. 2022–2023 PG&E Electric and Gas Service Requirements (Greenbook)
 - 2. 2019 California Building Code
 - 3. 2019 California Plumbing Code
 - 4. 2019 California Mechanical Code
 - 5. 2019 California Electrical Code

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- 6. 2019 California Fire Code
- 7. Title 24, California Code of Regulations.

Nothing in these plans or specifications is to be construed to permit work not conforming to these codes. Furnish without extra charge, any additional material and labor required to comply with these rules and regulations.

1.17 **FEE AND PERMITS:** Procure and pay for all licenses, fees and permits required.

This includes, but is not limited to procurement and payment for an encroachment permit for work in the City Right of Way. Contractor shall obtain an encroachment permit that covers their work as well as work to be performed by PG&E related to the project work.

1.18 **UTILITY COORDINATION:** It shall be the contractor's responsibility to arrange and coordinate with the PG&E for requests for service(s), execution of hot tie-in and the installation of meter(s) and services and inspections of Contractor's work. The contractor shall furnish all documentation and information that PG&E requires prior to start of construction.

- A. Contractor shall contact Brad Joaquin, PG&E Industrial Power Engineer – Stockton Division (209) 323-8106 within (20) twenty days of Award of Contract to coordinate gas line service and to schedule a kick-off meeting.

1.19 **SITE CONDITIONS** Information on the drawings relative to existing conditions is approximate only. Deviations found necessary during progress of construction to conform to actual conditions, as approved by the City, shall be made without additional cost to the owner. The contractor shall be held responsible for any damage caused to the existing property and services. Promptly notify the architect if services are found which are not shown on the drawings.

1.20 **GUARANTEE**

- A. Repair or replace any defective work, material or part which may appear within one year of the date of acceptance. This shall include damage by leaks.
- B. On failure to comply with the above guarantee within a reasonable length of time, after notification is given, the architect shall have the repairs made at the contractor's expense.

1.21 **RECORD DRAWINGS**

- A. Upon completion of the work, and as precedent to final payment, the contractor shall provide and deliver, to the City, updated reproducible drawings showing the work exactly as installed.

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PART 2 - PRODUCTS

- 2.2 Provide equipment as specified in Appendix B of these Specifications and the PG&E Greenbook.

PART 3 - EXECUTION

3.1 CONTRACTOR RESPONSIBILITY

- A. Contractor shall perform all excavation and install gas service line from existing gas main at South El Dorado Street including EFV, risers and bypass in accordance with PG&E Greenbook requirements, standards and details.
- B. Coordinate with PG&E to inspect work and to schedule PG&E's installation of meter and hot tie-in.

END OF SECTION 23 11 23

SECTION 26 01 00

GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. General: Furnish all labor, materials, apparatus, tools, equipment, transportation, temporary construction and special or occasional services as required to make a complete working electrical installation, as shown on the drawings or described in these specifications.
- B. Work Included:
 - 1. Installation of lighting fixtures, poles, and lighting controls
 - 2. Portland cement concrete foundations
 - 3. Branch circuit wiring, conductors, conduits and fittings
 - 4. Grounding
 - 5. Pull boxes, outlets boxes, wiring devices, covers and enclosures
 - 6. Demolition and removals
 - 7. Site work, trenching, backfill and compaction
 - 8. Panels and overcurrent devices
 - 9. Disconnect switches
 - 10. Metering equipment
 - 11. Testing
- C. Related Work: Perform the following work, in accordance with appropriate sections of the specifications cited, where and as necessary to furnish a complete, working electrical installation.

1.2 REFERENCES

- A. Specific:
 - 1. The following publications or editions of the documents current at the time a project is on-going shall apply:
 - a. National Electrical Code
 - b. California Building Code
 - c. State of California CALTRANS Standard Specifications
 - 2. Equipment and materials specified under this Division shall conform to the following standards where applicable.
 - a. UL, Underwriters' Laboratories

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- b. ASTM, American Society for Testing Materials
- c. ANSI, American National Standards Institute

1.3 DRAWINGS

- A. Layout: General layout shown on the drawings shall be followed except where other work may conflict with the Drawings.
- B. Accuracy:
 - 1. Drawings for the work under this Section are diagrammatic.
 - 2. Contractor shall verify lines, levels and dimensions shown on the Drawings and shall be responsible for the accuracy of the setting out of work and for its strict conformance with existing conditions at the site.

1.4 SUBSTITUTIONS

- A. General: Refer to Division - 1 for substitution requirements.

1.5 SUBMITTALS

- A. General: Refer to Division - 1 for submittal requirements.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Equipment and materials shall be properly stored and adequately protected and carefully handled to prevent damage before and during installation. Equipment and materials shall be handled, stored, and protected in accordance with manufacturer's recommendations and as approved by the City. Electrical conduit shall be stored to provide protection from the weather and accidental damage. Plastic conduit shall be stored on even supports and in locations not subject to direct sun's rays or excessive heat. Cables shall be sealed, stored and handled carefully to avoid damage to the outer covering or insulation and damage from moisture and weather. Damaged or defective items, in the opinion of the City, shall be replaced with new items at no cost to the City.

1.7 PERMITS AND FEES

- A. Provide and pay for all permits, licenses and fees required to carry on and to complete the work.
- B. Obtain and pay for Electrical permit.

PART 2 - PRODUCTS (Not applicable)

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PART 3 - EXECUTION

3.01 TESTS

- A. Tests shall be conducted during the construction period and at completion to determine conformity with applicable Codes and with these Specifications. Tests shall be performed in the presence of the City, and shall include, but are not limited to, the following:
1. Insulation Resistance: Perform 500-volt D.C. tests for one minute on all feeder conductors on 120/240volt system, including the neutral, and 500-volt D.C. tests for one minute on all feeder conductors; make a record of all readings to be included in the maintenance instructions. Repair or replace circuits showing less than 40 megohms resistance to ground. Make tests using Biddle Insulation Resistance Megger, or equal.
 2. Ground Continuity: Test ground wires for continuity.
 3. Circuits Continuity: Test all branch for continuity. Test all neutrals for improper grounds.
 4. Equipment Operations: Test lighting circuits for correct operation through their control devices.
 5. Lighting Control Circuits: Perform operation tests for all lighting circuits.
 6. Product Failure: Any product which fails during the tests or are ruled unsatisfactory by the City shall be replaced, repaired, or corrected as prescribed by the City at the expense of the Contractor. Tests shall be performed after repairs, replacements or corrections until satisfactory performance is demonstrated.
 7. Physical Inspection of Electrical Equipment and Cables: Inspection shall be made of all equipment to insure proper assembly and construction.

3.02 INSTRUCTIONS AND MANUALS

- A. Contractor shall at the time of completion, allot an adequate period for instruction of City's operations and maintenance personnel in the use of the lighting systems.
- B. Contractor making all necessary arrangements with manufacturer's representatives. The equipment manufacturer shall provide product literature and application guides for the City's reference.

3.03 PROJECT RECORD DOCUMENTS (AS-BUILT)

- A. Provide Project Record Drawings and Specifications as required by other Sections of the Specifications and as required herein. Such drawings shall fully represent installed conditions including actual location of outlets, correct conduit and wire sizing as well as routing, revised fixture scheduling listing the manufacturer and products, as actually installed.

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- B. All changes to drawings shall be clearly marked on plans and submitted to City. Contractor shall make final record drawings.

3.04 WORKMANSHIP

- A. Preparation, handling and installation shall be in accordance with Manufacturer's written instructions and technical data, for the product specified, and/or approved except as otherwise specified. Coordinate work and cooperate with others in furnishing and placing this work. Work to approved shop drawings for work by others and to field measurements as necessary to properly fit the work.
- B. Conform to the National Electrical Contractors Association Standard of Installation for general installation practice.

3.05 PROTECTION

- A. Keep conduits, junction boxes, outlet boxes, and other openings closed to prevent entry of foreign matter. Cover fixtures, equipment and apparatus and protect against contamination or damage from dirt, paint, water, chemical or mechanical means, before and during construction period. Restore to original condition any fixture, apparatus, or equipment damaged prior to final acceptance, including restoration of damaged shop coats of paints, before final acceptance. Protect bright finished surfaces and similar items until in service. No rust or damage will be permitted.

3.06 SPECIAL TOOLS

- A. All special tools for proper operation and maintenance of the equipment provided under this section shall be delivered to the City.

3.07 CUTTING AND PATCHING

- A. Install all required conduits, sleeves, forms and insets before new pavement and surfacing is installed. Trenching, cutting and patching caused by failure to provide or properly located conduits and sleeves, forms and inserts, incorrect location of work or failure to cooperate with other trades, shall be done at expense of trade responsible.
- B. No cutting of finished or structural work may be done without acceptance. When necessary to have finished material or structural work cut, finish necessary drawings to trade whose materials are out to be cut.

3.09 CLEARANCES

- A. Provide working clearances in front, back, and to sides for all electrical equipment as required by National Electrical Code Article 110.

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END OF SECTION 26 01 00

**SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION**

SECTION 26 05 19

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies the furnishing, installation, connection, and testing of the electrical conductors and cables for use in electrical systems rated 600 V and below, indicated as cable(s), conductor(s), wire, or wiring in this section.

1.2 RELATED WORK

- A. Section 07 84 00, FIRESTOPPING: Sealing around penetrations to maintain the integrity of fire-resistant rated construction.
- B. Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS: Requirements that apply to all sections of Division 26.
- C. Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS: Requirements for personnel safety and to provide a low impedance path for possible ground fault currents.
- D. Section 26 05 33, RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS: Conduits for conductors and cables.
- E. Section 26 05 41, UNDERGROUND ELECTRICAL CONSTRUCTION: Installation of conductors and cables in manholes and ducts.

1.3 QUALITY ASSURANCE

- A. Quality Assurance shall be in accordance with Paragraph, QUALIFICATIONS (PRODUCTS AND SERVICES) in Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.

1.4 SUBMITTALS

- A. Submit in accordance with Paragraph, SUBMITTALS in Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS, and the following requirements:
 - 1. Shop Drawings: Submit sufficient information to demonstrate compliance with drawings and specifications.
 - a) Submit the following data for approval:

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- 1) Electrical ratings and insulation type for each conductor and cable.
- 2) Splicing materials and pulling lubricant.
- b) Certifications: Two weeks prior to final inspection, submit the following.
 - 1) Certification by the manufacturer that the conductors and cables conform to the requirements of the drawings and specifications.
 - 2) Certification by the Contractor that the conductors and cables have been properly installed, adjusted, and tested.

1.5 APPLICABLE PUBLICATIONS

- A. Publications listed below (including amendments, addenda, revisions, supplements and errata) form a part of this specification to the extent referenced. Publications are reference in the text by designation only.
- B. American Society of Testing Material (ASTM):
 1. D2301-10 Standard Specification for Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape
 2. D2304-18 Test Method for Thermal Endurance of Rigid Electrical Insulating Materials
 3. D3005-17 Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape
- C. National Electrical Manufacturers Association (NEMA):
 1. WC 70-21 Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy
- D. National Fire Protection Association (NFPA):
 1. 70-23 National Electrical Code (NEC)
- E. Underwriters Laboratories, Inc. (UL):
 1. 44-18 Thermoset-Insulated Wires and Cables
 2. 83-17 Thermoplastic-Insulated Wires and Cables
 3. 467-13 Grounding and Bonding Equipment
 4. 486A-486 B-18 Wire Connectors
 5. 486C-18 Splicing Wire Connectors
 6. 486D-15 Sealed Wire Connector Systems
 7. 486E-15 Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors
 8. 493-18 Thermoplastic-Insulated Underground Feeder and Branch Circuit Cables

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9. 514B-12 Conduit, Tubing, and Cable Fittings

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

- A. Conductors and cables shall be in accordance with ASTM, NEMA, NFPA, UL, as specified herein, and as shown on the drawings.
- B. Conductors shall be copper.
- C. Single Conductor:
 - 1. No. 12 AWG: Minimum size, except where smaller sizes are specified herein or shown on the drawings.
 - 2. No. 8 AWG and larger: Stranded.
 - 3. No. 10 AWG and smaller: Solid; except shall be stranded for final connection to motors, transformers, and vibrating equipment.
 - 4. Insulation: THHN-THWN and XHHW-2. XHHW-2 shall be used for isolated power systems.
- D. Direct Burial Cable: UF or USE cable.
- E. Conductor Color Code:
 - 1. No. 10 AWG and smaller: Solid color insulation or solid color coating.
 - 2. No. 8 AWG and larger: Color-coded using one of the following methods:
 - 3. Solid color insulation or solid color coating.
 - 4. Stripes, bands, or hash marks of color specified.
 - 5. Color using 19 mm (0.75 inches) wide tape.
 - 6. For modifications and additions to existing wiring systems, color coding shall conform to the existing wiring system.
 - 7. Conductors shall be color-coded as follows:

208/120 V	Phase	480/277 V
Black	A	Brown
Red	B	Orange
Blue	C	Yellow
White	Neutral	Gray *
* or white with colored (other than green) tracer.		

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8. Lighting circuit “switch legs”, and 3-way and 4-way switch “traveling wires,” shall have color coding that is unique and distinct (e.g., pink and purple) from the color coding indicated above. The unique color codes shall be solid and in accordance with the NEC. Coordinate color coding in the field with the //Resident Engineer// //COR//.
9. Color code for isolated power system wiring shall be in accordance with the NEC.

2.2 SPLICES

- A. Splices shall be in accordance with NEC and UL.
- B. Above Ground Splices for No. 10 AWG and Smaller:
 1. Solderless, screw-on, reusable pressure cable type, with integral insulation, approved for copper and aluminum conductors.
 2. The integral insulator shall have a skirt to completely cover the stripped conductors.
 3. The number, size, and combination of conductors used with the connector, as listed on the manufacturer's packaging, shall be strictly followed.
- C. Above Ground Splices for No. 8 AWG to No. 4/0 AWG:
 1. Compression, hex screw, or bolt clamp-type of high conductivity and corrosion-resistant material, listed for use with copper and aluminum conductors.
 2. Insulate with materials approved for the particular use, location, voltage, and temperature. Insulation level shall be not less than the insulation level of the conductors being joined.
 3. Splice and insulation shall be product of the same manufacturer.
 4. All bolts, nuts, and washers used with splices shall be //zinc-plated//cadmium-plated// steel.
- D. Above Ground Splices for 250 kcmil and Larger:
 1. Long barrel “butt-splice” or “sleeve” type compression connectors, with minimum of two compression indents per wire, listed for use with copper and aluminum conductors.
 2. Insulate with materials approved for the particular use, location, voltage, and temperature. Insulation level shall be not less than the insulation level of the conductors being joined.
 3. Splice and insulation shall be product of the same manufacturer.
- E. Underground Splices for No. 10 AWG and Smaller:

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1. Solderless, screw-on, reusable pressure cable type, with integral insulation. Listed for wet locations, and approved for copper and aluminum conductors.
 2. The integral insulator shall have a skirt to completely cover the stripped conductors.
 3. The number, size, and combination of conductors used with the connector, as listed on the manufacturer's packaging, shall be strictly followed.
- F. Underground Splices for No. 8 AWG and Larger:
4. Mechanical type, of high conductivity and corrosion-resistant material. Listed for wet locations, and approved for copper and aluminum conductors.
 5. Insulate with materials approved for the particular use, location, voltage, and temperature. Insulation level shall be not less than the insulation level of the conductors being joined.
 6. Splice and insulation shall be product of the same manufacturer.//
- G. Plastic electrical insulating tape: Per ASTM D2304, flame-retardant, cold and weather resistant.

2.3 CONNECTORS AND TERMINATIONS

- A. Mechanical type of high conductivity and corrosion-resistant material, listed for use with copper and aluminum conductors.
- B. Long barrel compression type of high conductivity and corrosion-resistant material, with minimum of two compression indents per wire, listed for use with copper and aluminum conductors.
- C. All bolts, nuts, and washers used to connect connections and terminations to bus bars or other termination points shall be //zinc-plated//cadmium-plated// steel.

2.4 CONTROL WIRING

- A. Unless otherwise specified elsewhere in these specifications, control wiring shall be as specified herein, except that the minimum size shall be not less than No. 14 AWG, or as required by the control wiring equipment manufacturer.
- B. Control wiring shall be sized such that the voltage drop under in-rush conditions does not adversely affect operation of the controls.

2.5 WIRE LUBRICATING COMPOUND

- A. Lubricating compound shall be suitable for the wire insulation and conduit, and shall not harden or become adhesive.

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- B. Shall not be used on conductors for isolated power systems.

PART 3 - EXECUTION

3.1 GENERAL

- A. Installation shall be in accordance with the NEC, as shown on the drawings, and manufacturer's instructions.
- B. Install conductors in raceway systems.
- C. Splice conductors only in outlet boxes, junction boxes, pull boxes, manholes, or handholes.
- D. Conductors of different systems (e.g., 120 V and 277 V) shall not be installed in the same raceway.
- E. For conductors installed in vertical raceways, provide conductor support (also known as cable support), to counter gravity pull on conductor weight. Conductor support shall be split-wedge conductor support type. Prior to installing the conductor support plug, remove all pulling compound from conductors where they pass through the conductor support body. After installing the conductor support plug, tap the conductor support plug firmly in the conductor support body.
- F. In panelboards, cabinets, wireways, switches, enclosures, and equipment assemblies, neatly form, train, and tie the conductors with non-metallic "zip" ties.
- G. For connections to motors, transformers, and vibrating equipment, stranded conductors shall be used only from the last fixed point of connection to the motors, transformers, or vibrating equipment.
- H. Use expanding foam or non-hardening duct-seal to seal conduits entering a building, after installation of conductors.
- I. Conductor Pulling:
 - 1. Provide installation equipment that will prevent the cutting or abrasion of insulation during pulling. Use lubricants approved for the cable.
 - 2. Use nonmetallic pull ropes.
 - 3. Attach pull ropes by means of either woven basket grips or pulling eyes attached directly to the conductors.
 - 4. All conductors in a single conduit shall be pulled simultaneously.
 - 5. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- J. Number of conductors for branch circuits shall not exceed more than three branch circuits in any one conduit.

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- K. When stripping stranded conductors, use a tool that does not damage the conductor or remove conductor strands.

3.2 INSTALLATION IN MANHOLES

- A. Train the conductors around the manhole walls, but do not bend to a radius less than six times the overall conductor diameter.
- B. Fireproofing:
 - 1. Install fireproofing on low-voltage conductors where the low-voltage conductors are installed in the same manholes with medium-voltage conductors.
 - 2. Use fireproofing tape as specified in Section 26 05 13, MEDIUM-VOLTAGE CABLES, and apply the tape in a single layer, half-lapped, or as recommended by the manufacturer. Install the tape with the coated side towards the cable and extend it not less than 25 mm (1 inch) into each duct.
 - 3. Secure the fireproofing tape in place by a random wrap of glass cloth tape.

3.3 SPLICE AND TERMINATION INSTALLATION

- A. Splices and terminations shall be mechanically and electrically secure, and tightened to manufacturer's published torque values using a torque screwdriver or wrench.
- B. Where the Government determines that unsatisfactory splices or terminations have been installed, replace the splices or terminations at no additional cost to the Government.

3.3 CONDUCTOR IDENTIFICATION

- A. When using colored tape to identify phase, neutral, and ground conductors larger than No. 8 AWG, apply tape in half-overlapping turns for a minimum of 75 mm (3 inches) from terminal points, and in junction boxes, pull boxes, and manholes. Apply the last two laps of tape with no tension to prevent possible unwinding. Where markings are covered by tape, apply tags to conductors, stating size and insulation type.

3.4 FEEDER CONDUCTOR IDENTIFICATION

- A. In each interior pull box and each underground manhole and handhole, install brass tags on all feeder conductors to clearly designate their circuit identification

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and voltage. The tags shall be the embossed type, 40 mm (1-1/2 inches) in diameter and 40 mils thick. Attach tags with plastic ties.

3.5 EXISTING CONDUCTORS

- A. Unless specifically indicated on the plans, existing conductors shall not be reused.

3.6 CONTROL WIRING INSTALLATION

- A. Unless otherwise specified in other sections, install control wiring and connect to equipment to perform the required functions as specified or as shown on the drawings.
- B. Install a separate power supply circuit for each system, except where otherwise shown on the drawings.

3.7 CONTROL WIRING IDENTIFICATION

- A. Install a permanent wire marker on each wire at each termination.
- B. Identifying numbers and letters on the wire markers shall correspond to those on the wiring diagrams used for installing the systems.
- C. Wire markers shall retain their markings after cleaning.
- D. In each manhole and handhole, install embossed brass tags to identify the system served and function.

3.8 DIRECT BURIAL CABLE INSTALLATION

- A. Tops of the cables:
 - 1. Below the finished grade: Minimum 600 mm (24 inches) unless greater depth is shown.
 - 2. Below road and other pavement surfaces: In conduit as specified, minimum 760 mm (30 inches) unless greater depth is shown.
 - 3. Do not install cables under railroad tracks.
- B. Under road and paved surfaces: Install cables in concrete-encased galvanized steel rigid conduits. Size as shown on plans, but not less than 50 mm (2 inches) trade size with bushings at each end of each conduit run. Provide size/quantity of conduits required to accommodate cables plus one spare.

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- C. Work with extreme care near existing ducts, conduits, cables, and other utilities to prevent any damage.
- D. Excavation and backfill is specified in Section 31 20 00, EARTH MOVING. In addition:
 - 4. Place 75 mm (3 inches) bedding sand in the trenches before installing the cables.
 - 5. Place 75 mm (3 inches) shading sand over the installed cables.
 - 6. Install continuous horizontal 25 mm by 200 mm (1 inch x 8 inches) preservative-impregnated wood planking 75 mm (3 inches) above the cables before backfilling.
- E. Provide horizontal slack in the cables for contraction during cold weather.
- F. Install the cables in continuous lengths. Splices within cable runs shall not be accepted.
- G. Connections and terminations shall be listed submersible-type designed for the cables being installed.
- H. Warning tape shall be continuously placed 300 mm (12 inches) above the buried cables.

3.9 ACCEPTANCE CHECKS AND TESTS

- A. Perform in accordance with the manufacturer's recommendations. In addition, include the following:
 - 1. Visual Inspection and Tests: Inspect physical condition.
 - 2. Electrical tests:
 - a) After installation but before connection to utilization devices, such as fixtures, motors, or appliances, test conductors phase-to-phase and phase-to-ground resistance with an insulation resistance tester. Existing conductors to be reused shall also be tested.
 - b) Applied voltage shall be 500 V DC for 300 V rated cable, and 1000 V DC for 600 V rated cable. Apply test for one minute or until reading is constant for 15 seconds, whichever is longer. Minimum insulation resistance values shall not be less than 25 megohms for 300 V rated cable and 100 megohms for 600 V rated cable.
 - c) Perform phase rotation test on all three-phase circuits.

END OF SECTION 26 05 19

SECTION 26 10 00

BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work specified in this section encompasses products, assemblies and basic installation methods required for electrical project systems specified under this Division.
- B. Work Included:
 - 1. Conduits and fittings
 - 2. Wire and cables
 - 3. Wire connections
 - 4. Pullboxes
 - 5. Outlet boxes
 - 6. Ground rods and clamps
 - 7. Duct seal compound
 - 8. Detectible marker tape
 - 9. Wiring devices and covers
 - 10. Time switches
 - 11. Pushbutton control stations
- C. Related Work: Section 26 01 00 - General Electrical Requirements

1.2 SUBMITTALS

- A. Submit in conformance with the requirements of Section 16010 the following items:
 - 1. Conduits and fittings
 - 2. Wire and cables
 - 3. Wire connections
 - 4. Pullboxes
 - 5. Outlet boxes
 - 6. Ground rods and clamps
 - 7. Duct seal compound

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8. Detectible marker tape
9. Wiring devices and covers
10. Time switches
11. Pushbutton control stations

PART 2 - PRODUCTS

2.1 CONDUIT AND FITTING

A. Rigid Steel Conduit

1. Conduit, rigid steel: full weight, threaded, hot-dip galvanized, inside enameled, conforming to ANSI C80.1
2. Three-piece couplings: electroplated, cast malleable iron: Efcor 165 series, O.Z./Gedney 4-50 series, or equal
3. Threadless couplings: electroplated, cast malleable iron, with integral conduit stop: Efcor 1760, or equal.
4. Threadless connectors: electroplated, cast malleable iron, on threaded male hub plastic insulated throat rated 90 degrees C minimum: Efcor 1750B series, O.Z./Gedney 31-050 1T series, or equal.
5. Insulated bushings: threaded polypropylene or thermosetting phenolic rated 150 degrees C minimum.
6. Insulated grounding bushings: threaded cast malleable iron body with insulated throat and steel, "lay-in" ground lug with compression screw: O.Z./Gedney BLG series, Thomas & Betts 3870 series, or equal.
7. Insulated metallic bushings: threaded cast malleable iron body with plastic insulated throat rated 105 degrees C.: O.Z./Gedney Type B, Thomas & Betts 1222 series, or equal.
8. PVC coated conduit as manufactured by Rob-Roy, shall be used were indicated on Drawings, suitable for direct burial without concrete encasement.

B. Rigid Non-Metallic Conduit PVC:

1. Schedule 40 and 80, UL listed, per ASTM D 2447, conforming to NEMA TC 3.
2. All fittings solvent welded.
3. As manufactured by Carlon, PW Pipe, or equal.

C. Non-Metallic Polyethylene Plastic Conduit (HDPE)

1. Schedule 40 and 80 High Density Polyethylene, per ASTM D 2447, conforming to NEMA TC 3.

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2. All fittings solvent welded.
3. As manufactured by Wesflex Pipe Manufacturing, or equal.

D. Minimum acceptable conduit size: 2 inches unless otherwise indicated on Drawings.

2.2 WIRE AND CABLE

A. General

1. Acceptable manufacturers: Southwire, Triangle, PWC Inc., or equal.
2. Conductor material: All wire and cable shall be insulated copper for all wire sizes.
3. Insulation: Insulation shall be THWN-THHN for wire sizes through size 1/0 AWG. For larger wire sizes, insulation shall may be THWN, XHHW, THW or as required to suit application.
4. Fixture wire: Type AF.
5. Minimum conductor size: Power and lighting branch circuits: #12 AWG
6. Color coding: System conductors shall be identified as to phase connections by means of color impregnated insulation or approved colored marking tapes as follows:

<u>VOLTAGE</u>	<u>A PH.</u>	<u>B PH.</u>	<u>C PH.</u>	<u>NEUTRAL</u>	<u>GROUND</u>
240V/120	Black	Orange	Blue	White	Green

2.3 OUTLET BOXES AND COVERS

- A. Standard Outlet Boxes: Galvanized, one-piece, drawn steel, knock-out type box of size and configuration best suited to the application indicated on the Drawings. Minimum box size, 4 inches square by 1-1/2 inch deep.
- B. Cast Outlet Boxes: Cast aluminum or malleable iron, gasketed covers, threaded openings or hubs. Type FS, shallow, or FD, deep, as required to suit application. As manufactured by Crouse-Hinds, Appleton, Killark or equal.

2.4 ELECTRICAL SUPPORTING DEVICES

- A. Concrete Fasteners: Powder-driven concrete pin fasteners, low velocity type. As manufactured by Remington, Ramset, or equal.

Conduit Straps: Hot-dip galvanized, cast malleable iron, one-hole type straps with cast clamp-backs and spacers as required. As manufactured by O.Z./Gedney #14-50G straps and #141G spacers; Efcor #231 straps and #131 spacers, or equal.

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- 2.5 IDENTIFYING DEVICES: Wire & Terminal Markers: Self-adhering, pre-printed vinyl with self-laminating wraparound strips. As manufactured by Brady B191 series; Thomas & Betts WSI series, or equal.
- 2.6 GROUNDING
- A. Enclosures of equipment, raceways, and fixtures shall be permanently and effectively grounded. Provide code-sized, unless otherwise indicated, copper insulated green equipment ground with all conduit runs. Equipment ground shall originate at switchboard and/or panelboard ground bus and shall be bonded to all switch and receptacle boxes and electrical equipment enclosures, lighting poles ground lugs, and to driven ground rods in handholes.
 - B. Driven ground rods shall be copper-clad steel, minimum size 3/4" diameter x 10 feet long at main service, and 5/8" diameter x 8 feet long where installed in all handholes, vaults, etc, or as noted on Drawings. Ground rods shall be provided with suitable rod clamps of phosphor bronze (do not use clamps intended for water pipe connections); Erico, Eritech, Harger or approved equal,
- 2.7 PULLBOXES
- A. Reinforced concrete boxes shall be as manufactured by Christy, Carson, Jensen, Quazite, or approved equal, and as indicated on Plans.
 - B. Pull boxes, hand holes, and splice boxes shall be constructed of reinforced concrete, complete with basic bodies, risers and covers. Provide driven-ground rods in all hand holes and splice boxes with steel lids/covers used for power with bonding wire attached between ground rod and lid/cover, or as indicated on Plans.
 - C. Covers shall be reinforced concrete where located in non-traffic areas, except that in grass or pavement cover shall be checker plate steel with hold down bolts. In areas subject to normal vehicle traffic, boxes shall be full-traffic rated H-20, with steel covers.
 - D. All covers shall be marked "ELECTRIC", or as otherwise directed by City's Representative.
- 2.8 DUCT SEAL: Non-hardening, non-oxidizing and non-corrosive sealing compound as manufactured by Duct-seal, Permagem, or approved equal.
- 2.9 DETECTIBLE MARKER TAPE: Detectable, direct burial, 3" wide red color, as manufactured by Mule, 3M, or approved equal.
- 2.10 WIRING DEVICES: Heavy duty commercial grade, switches and receptacles, as manufactured by LeGrand, Hubbell, or Leviton. Outdoor receptacles to be outdoor and tamper-resistant types with ground fault protection. Outdoor devices to be provided with raintight outdoor covers.

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- 2.11 TIME SWITCHES: Astronomic dial digital time switches, with power carry over, as manufactured by Tork, Sangamo, or Intermatic. Provide with metal enclosures suitable for environment.
- 2.12 PUSHBUTTON CONTROL STATIONS: Vandal resistant, outdoor, momentary contact, control stations, with descriptive nameplate, cast metal housing and nameplate holder, suitable for mounting to steel conduit support. As manufactured by McCain, Economy, or equal.
- 2.13 PHOTOELECTRIC CONTROLS: Outdoor, adjustable, photoelectric controls, mounted to cast metal outlet boxes, of suitable load and voltage rating for specific application. As manufactured by Tork, Intermatic, or equal.

PART 3 - EXECUTION

3.1 CONDUIT AND RACEWAY APPLICATIONS

- A. Rigid Steel Conduit: For all exposed conduit exposed to mechanical damage, and Underground, with corrosion resisting tape wrapping.
- B. Liquid-Tight Flexible Metallic Conduit: For connections in damp and wet locations to motors, solenoid valves, and similar devices, shall be made using liquid-tight flexible metallic conduit. Provide separate ground wire independent of conduit, run inside conduit and bonded at both ends to enclosures.
- C. Rigid Non-Metallic Conduits: Schedule 40 & 80 PVC may be used underground only, with 3" sand under and 3" sand over when serving lighting circuits and power secondary circuits.

3.2 CONDUIT INSTALLATION

A. General

- 1. Conduit system shall be concealed unless exposed work is clearly indicated on the Drawings.
- 2. Conduits shall be tightly covered and well protected during construction using metallic bushings and bushing "pennies" to seal open ends.
- 3. In all empty conduits or ducts, install a 200-pound tensile strength, polyethylene, pulling rope.
- 4. Conduit systems shall be electrically continuous throughout. Install code size, insulated, copper, green grounding conductor in all conduit runs indicated, or required by code, or as indicated on Drawings.

B. Layout

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1. Locations of all conduit runs shall be coordinated with the paving, drainage and site work in the same areas.
2. Conduits shall not be placed closer than 12 inches from a parallel water line, or 6 inches from such lines crossing perpendicular to the runs.

C. Supports

1. All raceway systems shall be secured to the building structures using specified fasteners, clamps and hangers spaced according to code requirements.
2. Support single runs of conduit using one-hole pipe straps. Where run horizontally on walls in damp or wet location, install "clamp backs" to space conduit off the surface.

D. Termination and Joints

1. Raceways shall be joined using specified coupling or transition couplings where dissimilar raceway systems are joined.
2. Conduits shall be securely fastened to cabinets, boxes and gutters using two-locknuts and an insulating bushing or specified insulated connectors. Install grounding bushings or bonding jumpers on all conduits terminating at concentric knockouts.
3. Conduit terminations exposed at weatherproof enclosures and cast outlet boxes shall be made watertight using specified connectors and hubs.

3.3 CABLE AND WIRE INSTALLATION

A. General

1. Conductors shall not be installed in conduit until all work of any nature that may cause insulation injury is completed. Care shall be taken in pulling conductors that insulation is not damaged. UL approved non-petroleum base and insulating type pulling compound shall be used as needed.
2. All cables shall be installed and tested in accordance with Manufacturer's requirements and warranty.

B. Splicing and Terminating

1. All aspects of splicing and terminating shall be in accordance with cable manufacturers published procedures.
2. Make up all splices in outlet boxes with connectors as specified herein with separate tails of correct color to be made up to splice. Provide at least six (6) inches of tails packed in box after splice is made up.
3. All wire and cable in panels, terminal cabinets and equipment enclosures shall be bundled and clamped.

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4. All phase conductors in underground pull boxes shall be tagged with a cable marker indicating circuit identification.

END OF SECTION 26 10 00

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SECTION 26 20 00

ELECTRICAL EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

- A. Work under this section includes products, assemblies and basic installation methods required for electrical project systems specified herein but shall not be limited to the following:
1. Panelboards
 2. Safety switches
 3. Overcurrent devices
 4. Service metering equipment

1.02 SUBMITTALS

- A. Submit the following items in accordance with Division 01, Shop Drawings, Product Data, and Samples.
1. Panelboards
 2. Safety switches
 3. Overcurrent devices
 4. Service metering equipment

1.03 SERVICE VOLTAGE

- A. Building Distribution Voltage:
1. Service equipment: 120/240volt, 3 phase 4 wires and 120/240volt, 1 phase, 3 wire.
 2. Lighting and receptacles panels: 120/240volts, 1 phase, 3 wire.

PART 2 - PRODUCTS

2.01 PANELS

- A. Panels shall be commercial grade construction, with enclosure sized 20 inches wide by 5 ¾ inches deep, suitable for exterior surface mounted as indicated on Drawings.
- B. Construction: Cabinets shall be provided with stretcher-leveled, steel doors and trim of code thickness, complete with concealed butt hinges. Provide combination spring catch and lock on inside edge of door trims with good

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- fitting joint between door and trim. Locks on all panelboards shall be keyed alike. Provide necessary hardware to permit locking circuit breaker handle in the "OFF" position. Provide a ground bar. All spaces shall be furnished with breaker mounting hardware.
- C. Finish: Finish shall be standard or custom baked factory finish. Do not paint in field.
 - D. Overcurrent Devices: Molded case, thermal magnetic circuit breakers 40 degrees C., ambient compensated, as specified under Section 26 10 00.
 - E. Terminal Lugs: Approved for use with copper conductors.
 - F. Buses: Bolted copper or tin-plated aluminum. Ratings as indicated on Drawings.
 - G. Additional Features: Refer to panel schedule for the following:
 - 1. Number and type of circuit breakers
 - 2. Bus ampacity and arrangements
 - 3. Terminal lug size and location
 - 4. Interrupting capacity
 - 5. Service voltage
 - 6. Mounting arrangement
 - H. Manufacturer: Square D, Eaton, Siemens, or equal.

2.02 SAFETY SWITCHES

- A. Provide and install safety switches as shown on the plans.
- B. Switch Interior: Dead-front construction with hinged arc suppresser and switch blades which are fully visible in the "OFF" position and with door open, rated heavy duty.
- C. Switch Mechanism: Quick-make and quick-break operating handle and mechanism with dual cover interlock to prevent unauthorized opening of the switch door in the "ON" position or closing the switch mechanism while the door is open.
- D. Ratings: Switches shall be horsepower rated for the operating voltage and with fused or non-fused arrangements as shown on Drawings.
- E. Enclosures: NEMA 1, code gauge sheet steel with hinged cover, or NEMA 3R, as shown on Drawings.
- F. Manufacturer: General Electric, Square D, Siemens or equal.

2.03 SERVICE METER PEDESTAL

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- A. Service panel enclosure shall be TESCO #24-100-series, or an equal accepted by the local utility.
- B. Furnish and install service meter pedestal complete with molded case circuit breakers, wiring devices and lighting controls as indicated on the Drawings. Breakers shall be bolt-on style, of the frame size indicated and as manufactured by Square D. or accepted equal. The enclosure shall be rain-tight with underground pull section indoor, NEMA Type III R, and shall be fabricated from sheet metal with a rust-inhibiting phosphate primer and baked enamel finish, in accordance with UL 98. Enclosure shall be UL listed.
- C. Install pedestal on concrete foundation complete with ground rod as indicated on Drawings.

PART 3 - EXECUTION

3.01 PANELS

- A. Set cabinets plumb and symmetrical with building lines.
- B. Weatherproof enclosures and panelboard shall be accurately aligned, leveled, and bolted in place to the galvanized steel channels, Unistrut P-1000 Galvanized, set in 12inch diameter x 24inch deep concrete footings.
- C. Equipment cabinets, etc. shall be anchored and braced to withstand seismic forces calculated in accordance with the California Building Code 2019, Chapter 16.
- D. "Train" interior wiring: Bundle and clamp using specified plastic wire wraps.
- E. Touch-up paint any marks, blemishes, or other finish damage suffered during installation.
- F. Replace cabinets, doors or trim exhibiting dents, bends, warps, or poor fit that may impede ready access, security, or integrity.

3.02 METERING EQUIPMENT

- A. Install meters as indicated on drawings. Wiring connections shall be made per PG&E requirements.
- B. Pedestals shall be bolted in place, and bottom channel shall be caulked watertight.
- C. Install labels for identification of all devices, circuit breakers, etc.

END OF SECTION 26 20 00

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SECTION 26 51 00

SITE LIGHTING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Installation and connection of all poles, luminaires, fixtures, lamps, drivers, lighting control devices, related components and accessory wiring as shown on the Plans, or as specified herein.

1.02 REFERENCES

- A. ANSI
- B. ASTM
- C. NFPA 70
- D. UL 1598
- E. CCR TL24

1.03 SUBMITTALS

- A. Submit in conformance with the requirements of Section 17 the following items:
 - 1. Catalog, and photometric data, for all lighting fixtures
 - 2. Poles, anchor bolts and accessories

1.04 COORDINATION

- A. Refer to Landscape Site Plans for exact locations of poles located in paved areas.

PART 2 - PRODUCTS

2.01 LIGHT EMITTING DIODES (LED'S)

- A. LEDs shall be as manufactured by Luxeon M series by Lumileds; or approved equal.
- B. LED, 4000 K correlated color temperature, producing a minimum of 90% of initial intensity at 100,000 hours of life based on IESTM-21. LEDs to be tested in accordance with IESLM-80 procedures.

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2.02 DRIVERS

- A. Driver as manufactured by Advance Xitanium, TRC Electronics, or approved equal, with universal voltage range (120-277V).

2.03 OPICAL SYSTEMS

- A. Micro-lens optical and reflector system to produce IESNA distributions as indicated on fixture schedule, and to be fully sealed to maintain an IP66 rating.
- B. Luminaire to produce 0% total lumens above 90° (Cal Green B/U/G, U=0).

2.04 ELECTRICAL

- A. Rated life of electrical components to be L70 105,000 – 130,000 hours. Power supply wired with quick-disconnect terminals. Power supply to have power factor of .90 and <20% Total harmonic distortion (TDH). Surge protection per IEEE/ANSI C62.41 Category C High, 20kV/10kA and ANSI C136.2-2015, 20kV/10kA.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Contractor shall be responsible for handling and mounting of fixtures. Fixtures shall be secured to poles and grounded to ground conductors.
- B. Install each fixture in a manner recommended by the fixture manufacturer and approved by the City.
- C. Poles shall be installed plumb, with anchor bolt nuts torqued to required limits. Repair any scratches or marring of paint finishes.
- D. All fixtures and poles shall be cleaned of any dust or dirt.
- E. Orientation of fixture shall be aligned with center line of parking lot or pathway as applicable.

END OF SECTION 26 51 00

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SECTION 26 60 00

SITE ELECTRICAL WORK

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included

1. Furnishing, installing and connecting of conduits, conductors, fittings and accessories.
2. Trenching, directional boring, excavation, and backfilling for all underground conduits and pull boxes.
3. Concrete work for conduit encasement.
4. Pavement, surfacing, and landscaping repairs.

1.02 RELATED SECTIONS

- A. Section 26 01 00 - General Electrical Requirements
- B. Technical Requirements

1.03 SEPARATION FROM OTHER SERVICES

- A. Separate conduit runs not less than one foot horizontally and one six inches vertically from gas, water, sewer and drainage lines.

1.04 STANDARD PRACTICES

- A. Installation of ducts and conduits shall be in accordance with latest edition of the NEC and State of California G.O. 128

PART 2 - PRODUCTS (Refer to Section 26 10 00)

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PART 3 - EXECUTION

3.01 EXCAVATION

- A. Excavations shall be open vertical construction of width to provide free working space around the work and to provide space for backfill and tamping.
- B. Provide safety shoring, bracing or bulk-heading to support excavations and maintain warning signs and barricades. Provide suitable temporary steel covers over excavations crossing roadways or walks.
- C. Excavate all trenches so that minimum coverage above conduits not encased in concrete to finish grade is not less than 24", unless otherwise specified or shown on Drawings, or included in the technical requirements section
- D. For non-metallic conduits not encased in concrete, excavate trench 3" below the required grade. Place 3" bed of sand properly compacted and graded to provide uniform bearing surface for conduits or ducts, unless otherwise specified or shown on Drawings, or included in the technical requirements section.
- E. Keep excavations free of water.

3.02 BACKFILLING

- A. Cover non-metallic conduits and ducts not encased in concrete with a minimum 3" layer of sand or select fill. Compact the sand and select fill backfill per specifications.
- B. Except where sand or select fill is required as specified above and except under paved areas, walks or roads, use backfill of suitable excavated material with a 2" maximum rocks or clods. If excavated material is unsuitable or inadequate for the backfill as specified, furnish and import additional suitable materials to complete the work.
- C. Compact the fill by adding backfill material in 8" maximum layers and tamping by hand or machine. Do not machine-tamp first backfill layer over non-metallic conduits or ducts not concrete encased.

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- D. Remove shoring as backfill is placed. Remove from property surplus material remaining after backfilling, or place as directed by City's Representative.
- E. Place detectable 3" wide WARNING-ELECTRIC marker strips the continuous length of trench, down 12" from finish grade. Strips shall be installed over all conduits.
- F. Replace existing road, walkway, pavement, or similar surfaces, to match existing work, and as indicated on Drawings.
- G. Bring to grade any subsidence occurring during the Guarantee Period by adding surfacing materials of the like kind.

3.03 SPLICEBOXES, PULLBOXES AND HANDHOLES

- A. Place conduit entries using knockout panels provided. Pour concrete around conduits to anchor them in place.
- B. Provide End Bells at all PVC conduits entering boxes and handholes.
- C. Install boxes and handholes flush with grade or pavement. In vehicular pavement use boxes with covers that are H-20 traffic-rated with checker plate steel covers with locking bolts. In landscape areas use reinforced concrete covers. All covers shall be marked "Electric", or markings as directed by City.
- D. Handholes and pull boxes shall consist of base section and cover, set on a minimum 6" bedding of pea-gravel from river washer stone.

3.04 RACEWAYS

- A. Install conduit runs straight and true between vaults and spliceboxes. Minimize use of bends. For alignment curves, use not more than 5degrees segments for each standard straight length. Begin to fan out ducts from standard separation to splice box, handhole or vault entrance at least 30' from entrance, using gradual alignment changes at coupling of each straight section.
- B. Make bend radius to centerline of all conduits not less than 10 times nominal diameter of conduit. Rod all underground raceways with approved flexible mandrels and brushes to remove all obstructions and to prove that raceways are clear and usable.
- C. Furnish and install MULETAPE pull lines in all empty raceways. Pull line shall be continuous from/pullbox to pullbox, or vault, with 36" of slack left at each termination.

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3.05 HORIZONTAL DIRECTIONAL DRILLING

- A. Contractor shall have the option of using either open-cut trenching or horizontal directional drilling for the installation of underground conduits. Surface conditions over the site contain extensive rock and boulders exceeding 6" in width.
- B. Horizontal directional drilling shall include the use of mechanical and hydraulic deviation equipment to allow for changing the direction of the boring course at any point during the operation. The equipment shall include instruments capable of monitoring the exact location of the drilling head assembly. The equipment shall be capable of both creating and directing the bore-hole along a predetermined path to the specified target location.
- C. Horizontal directional drilling shall be done with fluid-assisted mechanical cutting. Drilling fluids shall be as recommended by the equipment manufacturer. Contractor shall be responsible for regulating pressure and flow rates so that compaction of the surround sub-grade materials around the bore is not altered.
- D. Uncontrolled jetting (using fluid force to erode the soil) is prohibited. Any area where sub-grade and/or aggregate base compaction has been damaged by boring shall be repaired at the Contractor's expense, and to the satisfaction of City. Repair work shall include removal and replacement of surface paving at the Contractor's expense, if required for proper sub-grade and/or aggregate base compaction.
- E. Mobile horizontal directional drilling system shall be capable of being started at the existing finish grade at an inclined angle to achieve required depth. The equipment shall have capacity to drill a 2" to 3" diameter pilot hole up to 200'. The drill head assembly shall utilize small diameter fluid jets to fracture along with mechanical cutters to bore and excavate soil as the head advances. The pilot hole is to be enlarged with reamers as required and the line pulled into the hole with fluid mixtures in accordance with the equipment manufacturer's directions.

END OF SECTION 26 60 00

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SECTION 26 66 00

SPORTS LIGHTING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Basic Work shall be to provide and install new LED sports lighting fixtures, together with mounting brackets, and lighting control devices, related components and accessory wiring as shown on the plans, for the basketball and futsal courts, and as specified herein.

PART 2 – PRODUCTS

2.01 GENERAL

- A. Refer to Drawings and fixture schedule for details and specifications for fixtures.
- B. Manufacturer: Court lighting fixtures, and arms, shall be as manufactured by NLS Lighting, using type “VUE” luminaires, gray finish, with type IV optic distribution, or approved providing equivalent court illumination, and equal to or less than the specified fixture wattage.

2.02 LAMPS

- A. LED light engines constructed of heavy-duty die-cast aluminum with external heat, shall each have a total of 192 LEDs, IES Type IV distribution. Operating current at 700mA, 95% power factor; 47,845 lumen output at 5000K and 75CRI; universal voltage driver; knuckle mounts to slip over 2 3/8” diameter tenon on cross arm; gray finish, 10kV surge protector standard.
- B. UL listed for wet location, IP65, LM79 and LM80, RoHS compliant.

2.03 POLES

- A. Existing poles shall be used for mounting new LED sports lights. Existing fixtures shall be removed and disposed of. One of the existing poles shall be relocated as shown on drawings. New anchor bolts shall be provided to match existing.

PART 3 - EXECUTION

3.01 INSTALLATION

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- A. Install each sports court lighting fixture in a manner recommended by the fixture manufacturer. Under this Section of work, furnish and install all required brackets, fittings, and other elements to the existing poles to support fixtures.
- B. Noisy, failed, or malfunctioning ballasts, as judged by the City's representative, shall be repaired by Contractor, as an additional expense to the City.
- C. Contractor shall be responsible for handling and setting of the relocated pole. Pole shall be set perfectly plumb. Install non-shrink grout, 1.25inch minimum thickness, under baseplates of poles after pole have been plumbed, to completely conceal leveling nuts.
- D. Protect pole during the handling, assembly, and erection process.
- E. All new fixtures shall be aimed to best illuminate the play areas of the basketball courts. and Futsal courts. Refer to manufacture's aiming diagrams.
- F. Paint Damage: Paint finish of installed poles, arms and fixtures shall be unscratched, marred, or damaged. Touch up any damage with manufacturer provided paint.

3.02 SEPARATION OF SPORTS COURTS LIGHTING CONTROLS

- A. Basketball and Futsal sports lights shall operate independently. Wiring modifications shall be made to three of the existing poles to allow for two light circuits to be installed, allowing one circuit to control light to basketball and the other for Futsal.
- B. Two new pushbutton stations shall be installed, one to control lights for Futsal, and the other to control basketball. New time delay relays will be required to be insalled in the existing lighting controls enclosure.

3.03 TESTING AND VERIFICATION

- A. Test sports court lights through their controls and demonstrate to the City's representative that all systems are operating properly.
- B. Nighttime illumination verification tests shall be required to verify correct performance of the lighting system. Contractor shall be responsible for re-aiming fixtures to correct illumination deficiencies between field measurements and manufacture's computer generated photometrics.

END OF SECTION 26 66 00

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SECTION 32 01 90

LANDSCAPE MAINTENANCE

PART 1 - GENERAL

1.1 SCOPE

- A. Work in this section includes the growing and maintenance operations necessary to establish the newly planted turf, shrubs, trees, and other plantings; to provide insect and disease control, to implement Turf Maintenance Treatment and to maintain the irrigation system, and related construction elements.

This Section also covers work related to Turf Maintenance Treatment as delineated the Drawings and consists of thatching, coring, adding, topdressing soil, and overseeding those areas.

- B. Related work specified elsewhere:
1. Planting Irrigation - Section 32 84 00
 2. Landscape Soil Preparation – Section 31 92 13
 3. Planting - Section 32 93 00

1.2 SUBMITTALS

- A. Soil Testing: Contractor shall collect *two (2)* one-quart samples in the turf area and *two (2)* one-quart samples in the container planting areas of the in-place topsoil 20 days after completion of planting and submit to Waypoint Analytical, Inc. of Anaheim, (714)282-8777, for maintenance period fertilizer recommendation. Test results shall be made available to the City's Representative. Sample shall be a representative composite taken from several planting areas. Cost of soil test shall be paid for by the Contractor.
- B. Herbicide/Fungicide/Insecticide: Submit a written recommendation from a State of California appropriately licensed individual along with complete product data from proposed manufacturer, for review by City Inspector and/or City's appropriately licensed individual.
- C. Turf Maintenance Treatment Scope Schedule: Overseeding schedule shall be submitted to the City's Representative within thirty (3) days of the signed contract.

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1.3 REVIEWS

- A. The Contractor shall specifically request the following review by Owner's Representative:
 - 1. Review of initial thatching to review effectiveness (Turf Maintenance Treatment).
 - 2. Review of coring for depth and density of holes in turf (Turf Maintenance Treatment).
 - 3. Review of Topdressing for completeness of coverage and elimination of divots and gopher holes (Turf Maintenance Treatment).
 - 4. Review of Overseeding for completeness of coverage (Turf Maintenance Treatment)
 - 5. Fertilizer application.

1.4 SCHEDULE

- A. Work in this section, except as related to Turf Maintenance Treatment scope will not begin until the irrigation audit is complete.
- B. Maintenance and Warranty Period: Shall be per City of *Stockton* Standard Specifications.
- C. Maintenance period shall be for a minimum period of one-hundred-twenty (120) calendar days after pre-final inspection.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Seed Mix (for overseeding as part of Turf Maintenance Treatment): shall be per Planting – Section 32 93 00
- B. Fertilizer: Shall be per Landscape Soil Preparation – Section 31 92 13
- C. Water: During the course of construction and maintenance period water shall be paid for by the Contractor.
- D. Herbicide: Shall be a commercially available chemical recommended for this project and these plantings by a State of California appropriately licensed individual. The licensed individual shall review all planting, including but not limited to seed, sod, groundcovers, shrubs, and trees, the types and extent of soil preparation, the irrigation systems, drainage

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patterns, and other project characteristics to verify type, compatibility, and recommend the appropriate chemical(s) for use. Contractor shall be responsible for all overspray, spreading, runoff, plant health, and other impacts from the use of the chemical(s).

PART 3 - EXECUTION

- 3.1 **TIME LIMITS:** The maintenance period shall commence from the date of substantial completion of planting as defined in paragraph 3.7 below, and extend for a (120) one-hundred-twenty day period thereafter, or until the acceptance of Final Completion.
- 3.2 **FERTILIZER APPLICATION:** Fertilizer(s) shall be applied per soil testing laboratory recommendations. For bidding purposes, assume initial application to be four weeks after planting and subsequent applications to be at 45-day intervals.
- 3.3 **HERBICIDE APPLICATION:** Herbicide shall not be used until all plant material has been planted a minimum of 20-days. All planting areas shall be kept weed-free by non-herbicide methods during this time period. Herbicide shall not be applied to any areas that are or have been seeded. Contractor must apply the material in conformance with the written recommendations of the State appropriately licensed individual.
- 3.4 **BASIC REQUIREMENTS:** All planting areas shall be kept weed-free at all times during the maintenance period. All pest and disease control shall be the Contractor's responsibility. All planting areas shall be kept at optimum moisture for plant growth. Settlement of soil and plants and soil erosion shall be repaired, and areas replanted as required. Dying or deficient plants shall be replaced as soon as they become apparent.
- 3.5 **TURF MAINTENANCE TREATMENT**
 - A. **SCHEDULING:** Overseeding shall be performed as soon as possible to expedite grass growth for early Spring recreational use. Contractor shall schedule multiple tasks (i.e., irrigation work) concurrently to expedite the seeding to maximize the growth period.
 - B. **THATCHING:** Turf renovation shall occur over areas as designated on drawings. Turf area shall be newly mowed to the shortest height practical. Upon completion of mowing, the turf area shall be thatched and aerated following standard practices in the trade.
 - C. The intent is to leave 1/2 inch maximum thatch upon completion of thatching operation. No more than 1/2 inch of thatch shall be removed during any one thatching operation. Repeated passes may be necessary to remove thatch build up. Review total thatch removal from soil core with Owner's

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Representative prior to thatching operations. All thatch, clippings, and debris are to be removed from the turf.

- D. AERATION: Upon completion of thatching, aerate the turf via a coring method. Cores shall be pulverized as top dressing. Fertilize turf area upon completion of aeration. Contractor shall use a deep core aerator, consisting of 3/4 inch diameter tines and a minimum 2 inch coring depth. The area shall be aerated in multiple directions to provide cored holes no less than 3 inches apart.
- E. TOPDRESSING: After aeration has been completed, a 1-1/2 inch layer of topdressing soil (See Landscape Soil Preparation – Section 31 92 13.) shall be uniformly spread over these areas and dragged, raked, or otherwise worked into the area to fill cored holes, divots, gopher holes and depressions, and remove finish grade irregularities. Conform to infield and adjacent grades in a uniform manner and provide uniform slopes to facilitate drainage away from these areas and eliminate ponding.

All turf areas within the Turf Maintenance Treatment area are to have all the bare spots (exposed soil) infilled with topdressing soil and seeded. For the purposes of this project, bare spots are defined as any single exposed soil area over 36 square inches in size.

- F. SEEDING: All aerated areas shall be overseeded at the rate of 6 lbs per 1000 square feet. Seeding shall be uniformly applied using mechanical devices, sowing half of the rate in one direction and half at right angles. Seed shall be lightly raked, dragged, or rolled in place before fertilizing and watering.
- G. FERTILIZING: See Landscape Soil Preparation – Section 31 92 13.

- 3.6 MOWING HEIGHT: Contractor shall gradually reduce mowing height over maintenance period so that height is at 2 inches by the time of final completion. Turf shall be edged along all pavement edges by a bladed edger - no string trimmers.
- 3.7 CITY'S RESPONSIBILITY: Work installed under this contract that is damaged or stolen prior to Substantial Completion shall be repaired or replaced by the Contractor without cost to the City. After Substantial Completion and through the maintenance period, these damages and similar factors such as extensive litter, abuse and defacement shall be the City's responsibility to repair or replace and shall not be a part of this contract. No planting shall be guaranteed beyond the maintenance period, except as to conformance to specified species and variety,

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and except as to conditions specified under "Root Systems" of Planting, Section 32 93 00.

- 3.8 SUBSTANTIAL COMPLETION/BEGINNING OF MAINTENANCE PERIOD: Shall be deemed as the time all major plantings, including groundcover, are installed, and when the sod has fully knitted and seed mix has germinated uniformly over 90% of the Turf Maintenance Treatment area. Individual bare spots shall not exceed ten square feet within the seeded area. Maintenance period shall not commence until work is deemed substantially complete by the City.
- 3.9 CITY OPERATIONAL PERIOD: After 90 days of maintenance, the contractor shall call for an on-site meeting with the City, park owner, and City maintenance to review City operations. For the last 30 days of maintenance, the contractor shall maintain the park using the City's irrigation schedule, mowing schedule and maintenance program.
- 3.10 FINAL REVIEW: Contractor shall request a final review of the project at least fourteen (14) days in advance of the proposed date. Failure to request this notice shall automatically extend the date of completion. The maintenance period will continue until project is deemed complete.
- 3.11 Final equipment and appurtenance adjustments after initial break-in: Thirty (30) days after final acceptance and allowing public use of the facility, but prior to the end of the thirty five (35) day notice of completion filing period, the contractor shall return to the site and inspect and adjust all fasteners securing all installed site amenities including but not limited to: play equipment; benches; barbeques' picnic tables; sport equipment; etc.

END OF SECTION 32 01 90

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MCKINLEY PARK RENOVATION**

SECTION 32 01 91

TREE PROTECTION AND PRUNING

PART 1 – GENERAL

1.1 SCOPE

- A. Furnish and supply all equipment necessary for tree protection and pruning including, but not limited to, removal, protection and pruning of existing trees.
- B. All work shall be done per the International Society of Arboriculture (ISA) tree protection and pruning requirements.

1.2 ACCESS AND STORAGE

- A. Prior to commencement of work, the Contractor shall confer with the City and the Owner's Representative of the purposes of determining the exact scope of work. At no time shall materials, soil or equipment be stored or placed within the "dripline" of existing trees to be preserved. At no time shall vehicles be parked within the "dripline" of an existing tree to be preserved.

1.3 QUALIFICATION

- A. All pruning shall be done by a Certified Arborist or Certified Tree Worker

1.4 STANDARDS

- A. Best Management Practices for Pruning (International Society of Arboriculture, 2019)
- B. American National Standard for Tree Care Operations (Z133.1)
- C. American National Standard for Pruning (A300)

1.5 CO-ORDINATION AND SCHEDULING OF WORK

- A. All work shall be scheduled and conducted in a cooperative manner in order to give the least possible interference with or annoyance to others. Contractors shall work out any cooperative schedules. Construction of drainage and irrigation lines etc., around existing trees, shall receive priority in scheduling in order that trenching, irrigation installation and backfilling can be done in an expedient manner.

1.6 PROJECT STARTUP

- A. Prior to the start of construction the contractor shall meet on-site with the project arborist and owner's representative to review all work procedures, access routes, storage areas and tree protection measures.

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1.7 TREE PROTECTION ZONE

- A. The Tree Protection Zone (TPZ) shall be regarded as the area beneath a tree's canopy, or extending from the face of the trunk to 10 times the tree's diameter at breast height (DBH), whichever is greater.
- B. There shall be no dumping, washing out or storage of equipment or materials within the TPZ of any tree.

PART 2 – PRODUCTS

2.1 TREE PROTECTION FENCING

- A. All trees to be retained shall be temporarily fenced (chain link or snow fencing) at the dripline of tree, per plan.
 - 1. Orange Construction Fence: Shall be 36" high orange construction fence installed with t-posts per manufacturers recommendations.
 - 2. Temporary Chain Link *Construction* Fence: Shall be utilized around trees identified as Heritage Oak Trees on the Tree Disposition Plan

PART 3 - EXECUTION

3.1 STARTUP

- A. Prior to the start of construction the contractor shall coordinate a meeting on-site with the project arborist and City's representative to review all work procedures, access routes, storage areas and tree protection measures.

3.2 PRESERVATION OF EXISTING TREES

- A. Protection: Shall be as shown on plans.
- B. Tree Removal: Shall be per Demolition Section 02 41 13.
- C. Excavation, Trenching and Backfill: All trenching under the drip line of the tree shall be hand dug with no roots over 1 inch diameter being cut or damaged.
- D. Root System Repair: All exposed severed root ends are to be cut off smoothly.
- E. Watering: Shall be per plans.
 - 1. If trees show stress it may become necessary for Contractor to perform deep root watering as required at no extra cost to the City.

3.3 ROOT PROTECTION

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The following shall apply when removing existing pavement is in close proximity to existing trees to remain:

- A. Where root lifting of the pavement is evident, removal of pavement surfaces shall be done by hand.
- B. Remove existing pavement using a concrete blade to an approximate depth of 3.5" (assuming a 4" sidewalk depth) so as not to enter the base rock or soil below the existing walk.
- C. Do NOT remove sidewalk underneath any buttress root growth, leave in place undisturbed and cut outside the growth.
- D. Do not use any device which will damage the roots being exposed by the removal of the pavement.
- E. Do not walk on newly exposed roots.
- F. Do not store any materials on newly exposed roots.
- G. Roots shall be left in place for Arborist inspection if root pruning is deemed necessary.
- H. A 6-8" diameter mulch roll (weed barrier cloth filled with woodchips) shall be molded on top of large existing roots underneath the new sidewalk to allow for additional root diameter growth. 3/4 inch crushed drain rock shall be used in between the mulch rolls to fill up the height of the new sidewalk.

3.4 PRUNING EXISTING TREES

- A. Prune trees to remain in order to provide clearance for demolition and construction
- B. Clean the crown of existing trees to 1" diameter branches and reduce weight at the end of heavy branches.
- C. Crown raising, if necessary to provide clearance, must be approved by the project Consulting Arborist.
- D. All pruning shall be done by a Certified Arborist or Certified Tree Worker

3.5 PROTECTION OF TREES DURING CONSTRUCTION

- A. Install tree protection fencing as shown on the plans.
- B. Apply a three-inch layer of arbor mulch within the TPZ
- C. Install a 6" layer of mulch or 1" plywood within the TPZ of each tree when equipment access is required within the TPZ of the tree.

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- D. Storage of any construction materials, equipment or other materials within the TPZ is prohibited.
- E. No trenching or rototilling shall be allowed within the TPZ unless approved by the Project Arborist.
- F. Any roots damaged during construction shall be cut cleanly and flush with surrounding soil with a sharp blade or saw.

3.6 TRENCHING AND GRADING

- A. There shall be no trenching or grading within TPZ except with prior approval of the project arborist.
- B. Where trenching has been approved, the following procedures shall be applied:
 - 1. All trenching within the dripline of existing trees to remain shall be by hand or air spade with care taken not to cut or damage roots over 1-inch in diameter.
 - 2. All utilities, boxes, meters, vaults and services shall be routed beyond the TPZ.

END OF SECTION 32 01 91

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MCKINLEY PARK RENOVATION**

SECTION 32 15 40

STABILIZED DECOMPOSED GRANITE PAVING

PART 1 - GENERAL

1.1 SCOPE

- A. The extent of work in this section includes the provision of materials and labor for the construction of all stabilized decomposed granite paving.

1.2 QUALITY CONTROL

- A. Standards: Unless otherwise shown or specified, all materials and methods shall conform to the appropriate current sections of:
 - 1. The State of California, Department of Transportation Standard Specifications (DTSS) Section 20-10.
 - 2. Applicable ASTM Specifications as they reasonably apply to this work.
- B. Tolerances: Tolerances for subgrade, subbase, and finish grade shall be as specified by DTSS except that Contractor shall deliver the full decomposed granite thickness shown. No combination of high and low tolerances that compromise the section will be permitted.

1.3 SUBMITTALS

- A. Decomposed Granite: A one-quart sample with supplier and source clearly indicated of decomposed granite to be used shall be submitted to the Engineer for approval.

1.4 REVIEWS

- A. Contractor shall stake and layout all paving areas for review by the Engineer prior to excavation.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Decomposed Granite: Decomposed granite with stabilizer, hereafter referred to as "DG", shall be Gold Track Fines as available from T.M.T., Inc., 1996 Oakland Road, San Jose, CA 95131-1696, (408) 432-9040, or approved equal. Material shall also conform to the following:

Sieve Size

Percent Passing

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3/8"	100%
No. 4	85%-95%
No.8	75%-95%
No. 30	35%-55%
No. 200	10%-20%

The yellow-brown color, inherent to Gold Track Fines type DG is a requirement for this material. The Contractor shall obtain the approval of the Engineer in writing of the DG he proposes to use prior to delivery to the site.

- B. Stabilizer: Stabilizer shall be PHP Organic Aggregate Binder, or equal, and added to the DG at the rate of 15 lbs per ton of DG.
- C. Soil Sterilent: To be chlorate-borate material with not less than forty percent sodium chlorate and soluble in water to the extent of 3.5 lbs. of product per gallon of water ("Chipman-Chlorax 40", Atrizine 80W, or approved equal).

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Mixing: Materials shall be pre-mixed at the plant before being delivered to the site. No bucket mixing or on-site mixing will be allowed.
- B. Soil sterilent shall be applied to the subgrade soil of areas to be paved prior to baserock operations; uniformly applied per manufacturer's recommendations; minimum rate of 2.5 to 3.0 lbs./1000 square feet and watered with a minimum of 3 gallons/100 square feet. Contractor shall take all precautions necessary to avoid spray onto or runoff into planting areas.
- C. Construct Forms: Place and compact aggregate base.
- D. Placement: DG mixture shall be deposited in such a manner as to minimize the necessity for spotting, picking up, or otherwise shifting the mixture. The mixture shall be compacted by use of light roller. The mixture shall not be screeded off or finished by floating. No steel tooling of edges shall be done.
- E. Finish: The finished surface of the paving shall be kept moist for five days. Any cracks or wash-outs shall be filled in immediately.

**SPECIAL PROVISIONS
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3.2 CLEAN-UP

- A. Waste Removal: All waste incurred as a result of DG paving construction shall be removed from the site and disposed of legally. All excess DG shall be removed from planting area.

END OF SECTION 32 15 40

**SPECIAL PROVISIONS
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SECTION 32 18 23

INFIELD MIX

PART 1 - GENERAL

1.1 SCOPE

- A. The extent of work in this Section includes the provision of materials and labor for the installation of infield mix.

1.2 SUBMITTALS

- A. Infield Mix: A one-quart sample of the infield mix to be used shall be submitted to the Engineer.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Soil Sterilent: To be chlorate-borate material with not less than forty percent sodium chlorate and soluble in water to the extent of 4.0 lbs. of product per gallon of water ("Trifluralin HF", or approved equal).
- B. Infield surface mix shall be premixed as follows:
 - 1. "Allen's" processed clay 60%
 - 2. 1/8" minus red cinders 40%

Available from AA & Bob Allen Inc., 2904 Beyer Ln., Stockton, CA 95215, (209) 931-3535 or equal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Soil Sterilent: Shall be applied to the subgrade soil of areas to be paved prior to baserock operations; uniformly applied per manufacturer's recommendations; minimum rate of 2.5 to 3.0 lbs./1000 square feet and watered with a minimum of 3 gallons/100 square feet. Contractor shall take all precautions necessary to avoid spray onto or runoff into planting areas.
- B. Contractor shall roll and compact two (2) uniform lifts of the infield surface mix for a total of 6 inches of the surface mix. The roller shall not exceed 4 tons.

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- C. Grades: The finish grades of the infield mix shall conform to the lines and grades of the existing field and allow for drainage as indicated on the Drawings. Edges of infield mix shall be flush with adjacent concrete pavement.

3.2 CLEAN-UP

- A. Waste Removal: All waste incurred as a result of infield mix construction shall be removed from the site and disposed of legally. All excess infield mix shall be removed from site.

END OF SECTION 32 18 23

**SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION**

SECTION 32 18 24

SPORTS COURT SURFACING

PART 1 - GENERAL

1.1 SCOPE

This section shall consist of all furnishing and installing slip sheet overlay system as shown and specified including, but not necessarily limited to, textured colored acrylic, sports court surfacing, and slip sheet overlay related items.

1.2 REFERENCES

- A. National Asphalt Paving Association (NAPA)
- B. National Basketball Association (NBA)
- C. United States Futsal (USFF)
- D. USA Pickleball (USAP)
- E. American Sport Builders Association (ASBA), "Tennis Courts, A Construction & Maintenance Manual," 2015 Edition.

1.3 QUALITY ASSURANCE

- A. Surfacing shall conform to the guidelines of the ASBA for planarity.
- B. All surface coatings products shall be supplied by a single manufacturer.
- C. The contractor shall record the batch number of each product used on the site and maintain records of it through the warranty period and submit to City within one (1) week of substantial completion.
- D. The contractor shall provide the inspector, upon request, an estimate of the volume of each product to be used on the site.
- E. The installer shall be an authorized applicator of the specified acrylic finish system.
- F. The manufacturer's representatives shall be available to help resolve material questions.

1.4 SUBMITTALS

- A. Manufacturer specifications for components, color chart and installation instructions. Provide physical color samples of selected court colors for City review and approval.
- B. Submit list of projects noted in part 1.7 below.

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- C. Current Material Safety Data Sheets (MSDS).
- D. Current Material Safety Data Sheets (MSDS).

1.5 MATERIAL HANDLING AND STORAGE

- A. Store materials in accordance with manufacturer specifications and MSDS.
- B. Deliver product to the site in original unopened containers with proper labels attached.
- C. All surfacing materials shall be nonflammable.

1.6 GUARANTEE

- A. Provide a guarantee against defects in the materials and workmanship for a period of one year from the date of substantial completion.

1.7 INSTALLER QUALIFICATIONS

- A. Installer shall be actively engaged in construction and surfacing of acrylic basketball courts, play courts or similar surfaces, including installation of slip sheet overlay systems.
- B. Reference list from the installer of at least 5 projects successfully completed in Northern California of similar scope done in the past 3 years. Each listed project shall equal or exceed 5,000 sf in size. Provide project location, date of installation, square footage of basketball court surfacing for each project, and project contact name, address, and phone number with each installation listed.

1.8 TOLERANCES

- A. The finished surface of the slip sheet overlaid courts shall not vary more than 1/4" in 10'-0' when measured in any direction using a straight edge. At no point shall the surface fail to drain.

PART 2 - PRODUCTS

2.1 SLIP SHEET OVERLAY

- A. Crack Filler Material: Shall be Plexipave Crack Filler or approved equal.
- B. Court Patch Binder: Shall be California Products Court Patch Binder acrylic latex bonding liquid or approved equal. No asphaltic emulsions will be accepted.
- C. Glass Sheet: Shall be GlasPly IV fiberglass felt by Johns Manville or approved equal.

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- D. AC Filler Coat Binder: Shall be APOC AP330 from APOC or approved equal.
- E. Secondary Backing: Shall be ActionBac 3818 by Propex or approved equal.
- F. Surface Course, Aggregate:

Sieve Size	% Passing
#4	100
#8	95-100
#16	70-100
#30	40-75
#50	10-35
#100	2-15

2.2 SPORTS COURT FINISH SURFACING: Shall be Plexi Standard Hardcourt System by California Sports Surfaces (978-623-9980) consisting of the following components, or equal.

A. Acrylic Resurfacer (for Sports Court Finish Surfacing): Shall be by California Products Corporation or approved equal. 100% acrylic resin (no vinyl copolymerization constituent) with selected light fast pigments. Green shall contain not less than 8% chrome oxide.

- 1) Percent solids by weight (minimum) 36.5%
- 2) Weight 10.0-10.2 lbs./gallon

E. Filled Acrylic Finish Color (for Sports Court Finish Surfacing): Shall be Plexipave color base by California Products Corporation or approved equal. 100% acrylic resin containing no vinyl copolymerization constituent. Contains not more than 63% rounded silica sand.

- 1) Percent solids by weight (minimum) 74%
- 2) Weight 13.1-14.1 lbs./gallon

F. Line paint: Shall be California Line paint by California Products Corporation or approved equal. 100% acrylic resin containing no alkyds or vinyl constituents. Texturing shall be rounded silica sand.

- 1) Percent solids by weight (minimum) 60.5%
- 2) Weight 12-12.3 lbs./gallon

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- G. All surfacing materials shall be non-flammable and have a VOC content of not less than 100g./ltr. Measured by EPA method 24.
 - H. Local sands are not acceptable in the color playing surface. Sands must be incorporated at the manufacturing location to insure quality and stability.
- 2.3 COURT COLORS: Colors shall be as follows:
- A. Sports Court Surfacing Color A: Shall be “ Light Green”
 - B. Sports Court Surfacing Color B: Shall be “ Purple”
 - C. Court Lines: Shall be “ White”

PART 3- EXECUTION

3.1 WEATHER LIMITATIONS

- A. Do not install surfacing when rainfall is occurring or imminent.
- B. Do not apply unless surface and air temperatures are 50 degrees F and rising.
- C. Do not apply if surface temperature is in excess of 140 degrees F.

3.2 COURT PREPARATION

- A. Inspect the existing surface and scrape off old coatings that may be flaking or peeling.
- B. Clean the existing surface to wash away dirt, membranes, tape, other foreign matter, mold, fungus and mildew. Mark low areas that contain birdbaths.
- C. Clean out cracks with air compressor. Clean crack so that it is free of vegetation and debris. Remove all loose pavement from crack and grind down heaved edges at cracks exceeding 1/4” height. Broom or clean surface so it is clean and dust free.
- D. Cracks and holes shall be cleaned and a suitable soil sterilant, as approved by the Engineer, shall be applied to kill all vegetation 14 days prior to use of Court Patch Binder according to manufacturer's specifications.
- E. Crack Treatment: Fill cracks 1/4” wide or less with court patch binder. Cracks shall be hand-filled with square, snub-nose, hand trowel or broad knife with a narrow bead of material along crack. After the crack filler has been forced into to crack, the edges shall be wiped clean with a damp cloth. After drying, any rough or lifted edges shall be sanded smooth, and loose material shall be carefully removed from the court by air-broom and/or sweeping. All filling shall be flush and even with existing adjacent surface.

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- F. Any area showing algae growth shall be treated with Chlorox or approved equal to kill organisms and then the court shall be properly rinsed. Surface must be thoroughly dried prior to application of slip sheet overlay.
- G. Depressions: Depressions holding enough water to cover a nickel shall be filled with Court Patch Binder Patching Mix. This step shall be accomplished prior to the squeegee application of Acrylic Resurfacer. The contractor shall flood all the courts and then allow draining. Define and mark all areas holding enough water to cover a nickel. After defined areas are dry, prime with tack coat. Allow tack coat to dry completely. Spread Court Patch Binder mix true to grade using a straight edge. Steel trowel or wood float the patch so that the texture matches the surrounding area. Light misting on surface and edges to feather in is allowed as needed to maintain work ability. Allow to dry thoroughly and cure.
- H. Surface Acceptance: Court surfacing installer shall be responsible for reviewing and approving the final asphalt pavement grades and verifying that surface grades meet tolerances outlined in Paragraph 1.8 of this specification prior to installing sports court surfacing. Court surfacing installer to submit letter to Engineer stating that grades are acceptable and meets their requirements prior to applying tennis court surfacing.

3.3 SLIP SHEET OVERLAY

- A. Slip Sheet Overlay Application:
 - 1. All crack filling shall be flush and even with existing surface.
 - a. Lay one (1) layer of glass sheet over prepared surface. Lap all joints 2" and cement with secondary backing adhesive. Standard roofing felt is not acceptable.
 - b. Apply one (1) coat of AC filler coat binder over the glass sheet and allow to dry.
 - c. Over the entire area, apply one (1) layer of secondary backing, 2.3 oz. completely coated with AC filler coat binder emulsion (burlap will not be acceptable).
 - 2. Surface Course: A surface course of a 1/2" minimum thickness shall be constructed on the membrane, using the double straightedge course method.
 - a. The mix for the straightedge application shall be a combination of aggregate AC filler coat binder (25 gallon), plaster or mortar sand (700 lbs), 1/4" pea gravel (350 lbs), and sufficient water (10 gallons) to make a workable free flowing mix. Either a concrete or motor mechanical mixer can accomplish mixing. Taper surface course from 1/2"

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- thickness to 1/4" thickness over the outside 8 inches of the court perimeter.
- b. Material screeds where required shall be placed so that they are not over joints in the base course. The material shall be accurately screeded to grade.
 - c. The mix shall be placed, struck off, cured, smoothed and rolled.
 - d. The finished surface course shall not have any low areas exceeding 1/16" depth, or the approximate thickness of a nickel. The entire area shall be flooded and any finish grades that allow ponding or puddling of water will not be accepted. These areas shall be repaired with court patch binder and re-checked for conformance with the tolerances described in this section.
3. Job mixed AC filler coat binder surface coat with second layer of secondary backing.
- a. Surface shall be applied by pouring from a can or a wheeled container to continuous parallel lines and spreading immediately with a rubber faced squeegee. The squeegee or brooms shall be pulled on an angle from the line and spread so as to continually roll the material toward the operator and not overflow or "spill" on its forward edge away from the operator. After each coat has dried, any ridges shall be removed with scrapers.
 - b. Install second layer of secondary backing between coats.
 - c. Install final layer of AC filler coat binder.
4. Acrylic Resurfacer: Apply resurfacer over AC filler coat binder by pouring from a can or wheeled container to continuous parallel lines and spreading immediately with a rubber-faced squeegee. These shall be two applications of surfacer. The total amount of surfacer shall not be less than 60 gallons per 1,000 square feet.
- 1. Mix the ingredients thoroughly using accepted mixing devices and use a rubber bladed squeegee to apply each coat of Acrylic Resurfacer as required.
 - 2. Allow the application of Acrylic Resurfacer to dry thoroughly. Scrape off all ridges and rough spots prior to any subsequent application of Acrylic Resurfacer or subsequent color surface system.

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3.3 APPLICATION OF ACRYLIC COLOR PLAYING SURFACE

- A. All areas to be color coated shall be clean, free from sand, clay, grease, dust, salt or other foreign matters. The Contractor shall obtain the Engineer's approval, prior to applying any surface treatment.
- B. Blend color base and Plexichrome with a mechanical mixer to achieve a uniform Fortified Plexipave mixture. The mix shall be:
 - Color Base 30 gallons
 - Plexichrome 20 gallons
 - Water 20 gallons
- C. Application shall be made by rubber faced squeegees. The Fortified Plexipave mixture should be poured on to the court surface and spread to a uniform thickness in a regular pattern.
- D. A total of 3 applications of Fortified Plexipave shall be made. No application should be made until the previous application is thoroughly dry.
 - 1. Apply two squeegee applications of filled acrylic finish color. Minimum amount of undiluted filled acrylic material to be applied is 15 gallons per 1,000 square feet.
 - 2. Apply one brush or roller application of unfilled acrylic finish. Minimum amount of undiluted unfilled acrylic to be applied is 9 gallons per 1,000 square feet.

3.4 PLAYING LINES

- A. Playing lines shall be 2" wide unless otherwise noted accurately located and marked by snapping chalked line on the court surface. Install playing lines to standard dimensions and layout as described by ASBA and USTA (tennis), USAPA/IPA (pickleball) guidelines. The lines shall be solidly opaque.

3.5 PROTECTION AND INSPECTIONS

- A. The area shall be protected from traffic during all operations and shall not be opened for use for at least 24 hours after the finished surface has dried completely.
- B. Contractor shall notify the City at the completion of each stage of the operation and shall allow reasonable time for testing and inspection prior to proceeding with each following stage until authorization to proceed has been received from the City.

3.6 CLEAN-UP

- A. Remove all containers, surplus materials and debris. Dispose of materials in accordance with local, state and Federal regulations.

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- B. Remove residual chalk from line marking.
- C. Leave site in a clean, safe, and orderly condition each day.

END OF SECTION 32 18 23

**SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION**

SECTION 32 31 00

CHAIN LINK FENCING

PART 1 - GENERAL

1.01 Scope

- A. Furnish and install all labor, material, equipment, and services required to perform such work including, but not limited to, work as shown on the drawings and the following:
1. Installation of 5-ft, 6-ft, 8-ft and 12-ft high chain link fence
 2. Installation of chain link fence gates.
 3. Installation of chain link fence fabric rails and hardware
 4. Modification or Repair of existing chain link fence.

1.02 Submittals

- A. Contractor shall submit two complete sets of product data including shop drawings and materials order confirmation within ten (10) days after award of bid.

1.03 Standards

- A. All work shall conform to these Special Provisions, as well as all applicable codes of governmental agencies having jurisdiction over the work.
- B. Section 80 of the Standard Specifications for materials and installation shall apply to this Section unless noted otherwise.

PART 2 - PRODUCTS

2.01 Materials

- A. Fabric: Chain link, 9-gauge with a uniform square mesh measuring approximately 2 inches between its parallel sides, woven galvanized wire with a minimum of 1.20 oz. per square foot.
- B. Posts: shall be Sch. 40 steel pipe, sizes shall be as shown in plans.
- C. Mid Rail: Only where indicated. Shall be galvanized steel 1-5/8" outside diameter tubing, weighing 1.73 pounds per foot.
- D. Top Rail and Bottom Rail and/or Tension Wire: The fence shall have a continuous top and bottom rail for its full length of galvanized steel 1-5/8 inches outside diameter tubing, weighing 1.73 pounds per foot;.

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- E. Truss Braces: Truss braces and truss rods with turnbuckle attachments shall be installed between terminal posts and each adjacent intermediate post; sizes and specific locations as engineered by the fabricator and approved on the shop drawing;
- F. Fittings: All fixed component parts, such as tie wire, hog rings, post tops, bands, connections and rail ends, Post tops shall be simple can-type without ornamentation.
- G. Concrete Backfill: For all posts, shall be one part Portland Cement, three parts clean, sharp sand and five parts gravel or crushed rock.
- H. Tie Wires: Secure fabric with 9 gauge aluminum ties to intermediate posts at 1'-2" on center spacing and to rails at 2'-0" on center spacing. Secure fabric to tension wire with galvanized hog rings spaced 1'-0" on center,.
- I. Chain Link Fence Gate: Shall be as shown on the drawings,.

PART 3 - EXECUTION

3.01 Installation

- A. Fabric: Shall be installed on the court or field side of the posts; tops and bottom selvage knuckled and attached to posts with 9-gauge hog rings spaced no further than twelve inches apart.
- B. Tension Wire: Shall be tied to the fabric near the bottom at 24 inch intervals with hog rings.
- C. Top and Bottom Rail: Shall pass through openings provided in the post tops and each length shall be coupled with a sleeve coupling, or by a 3 inch long swaged end. Fabric shall be attached to the top rail by means of double-wrap tie wires spaced at intervals of approximately 2'-0".
- D. Posts: To be installed integral with mow band, where occurs, per drawings.

END OF SECTION 32 31 00

**SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION**

SECTION 32 33 00

SITE FURNISHINGS

PART 1 - GENERAL

1.1 SCOPE

A. Furnish and install all site furnishings, including but not necessarily limited to, benches,, picnic tables, bicycle racks, basketball backboards and hoops, barbecues,, bleachers, bat rack, player's bench, pitchers rubber, bases and home plate, backstop, park sign, shade shelter, futsal goals, play area fence, pool area fence, pool area gates and trash receptacles.

1.2 ACCEPTANCE: Prior to the purchase of the items and within five days of the award of the contract, the Contractor shall supply the Owner's Representative with samples of the finishes for approval by the City. No materials for this section shall be purchased until such approval is granted.

1.3 CERTIFICATION: Delivery schedules shall be verified and certified in writing to the Owner's Representative within ten days after the project commences.

1.4 SUBMITTALS: Submit catalog information and shop drawings for items:

- A. Backstop
- B. Benches
- C. Picnic Table
- D. ADA Picnic Table
- E. Bicycle Rack
- F. Trash Receptacle
- G. Group Barbecue Unit
- H. Barbecue Unit
- I. Bleachers
- J. Player's Bench
- K. Backstop
- L. Bases
- M. Bat Rack

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- N. Pool Area Fence
- O. Pool Area Gate
- P. Shade Shelter
- Q. Basketball Hoop, Backboard and Net
- R. Basketball Pole/Standard
- S. Futsal Goal

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Benches: Shall be South Bay Foundry Model #PB100-72, surface mount. Color to be Black, available from South Bay Foundry, 42 North Cluff Ave., Lodi, CA 95240 (209) 367-1940. Install with expansion shield and bolts.
- B. Picnic Table: Shall be DuMor model #75-80D, frame color to be black, surface mount. As available from Ross Recreation, P.O. Box 861, Folsom, CA 95763, (916) 985-6349.
- C. ADA Picnic Table: Shall be DuMor model #75-68-1D, frame color to be black, surface mount. As available from Ross Recreation, P.O. Box 861, Folsom, CA 95763, (916) 985-6349.
- D. Bicycle Rack: Shall be DuMor model #130-50, powder coated finish, color to be black, in ground mount. As available from Ross Recreation, P.O. Box 861, Folsom, CA 95763, (916) 985-6349.
- E. Barbecue Unit: Shall be DuMor, Grill 22-00-S-5, or approved equal, available from Ross Recreation Equipment, P.O. Box 861, Folsom, CA 95763 (916) 985-6349.
- F. Group Barbecue Unit: Shall be DuMor 24-00-S-5, or approved equal, Available from Ross Recreation Equipment, P.O. Box 861, Folsom, CA 95763 (916) 985-6349.
- G. Trash Receptacles: Shall be South Bay Foundry Hinged 35 gal, model #DTR125 with steel liner, or approved equal, modified with surface mount, finish to be Black, available from South Bay Foundry, 42 North Cluff Ave., Lodi, CA 95240 (209) 367-1940. Install with expansion shield and bolts provided by manufacturer.
- H. Shade Shelter: Shall be Classic Recreation Systems Orlando 28x35 Shade Structure, HR-36 steel roof, sub-surface mount columns or equal. As available from Ross Recreation Equipment, P.O. Box 861, Folsom, CA 95763 (916) 985-6349.

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Colors to be:

Roof - Sierra Tan

Column/Frame - Beige Brown

- I. Backstop: Shall be PW Athletic model #1246-55PV Heavy Duty Truss Backstop with Unpainted Douglas Fir planking. PC Frame. VC Mesh. 51 2 ½ Wide Opening x 17' Depth or approved equal. As available from NorCal Supply (925) 984-2075,.
- J. Bleachers: Shall be National Recreation Systems model #NB-0321AADA-3 Row x 21' Long Non-Elevated ADA Bleacher Aluminum Frame. Single 2"x 10" anodized seats. Double 2" X 10" mill finish foot planks. 48" vertical aisle and handrail on one side. 26 Seats + 2 ADA or equal As available from NorCal Supply (925) 984-2075,
- K. Player's Bench: Shall be PW Athletic model #BE-PB01500 – 15' Straight leg bench with back. 2" x 10" seat and back planks. In-ground mount., or approved equal. As available from NorCal Supply (925) 984-2075,
- L. Bat Rack: Shall be PW Athletic model #1280-08P Bat Holder for 8 Bats. Powder Coat Finish., in ground mount, with powder coated tan, or approved equal. As available from NorCal Supply (925)984-2075,
- M. Ball field Accessories: Shall be Douglas Sports as follows:
 - 1. Home plate: Champro #B0305
 - 2. Bases: Champro #B001X Pro Series bases with base anchor and plugs w/ Champro #B009F base plug indicator and Dig out tool.
 - 3. Pitching rubber: Chanpro #B043, 4 Way Pitching Rubber. Direct Bury.or approved equals. As available from NorCal Supply (925)984-2075,
- N. Futsal Goal: Shall be Forza 10x6.5 ALU110 Socketed Futsal Soccer Goal # SC13871, reinforced powder-coated aluminum with HDPE goal net and ground sockets, or equal as available from Forza Goal (866) 861-9095.
- O. Basketball Goal: Shall be model PW Athletic Mfg. Co. Model #1516-22-39-34.
Post: Model #1516(G) 4 ½ " outside diameter posts with 4ft offset,
Galvanized finish
Backboard: #22 – HD Heavy duty cast aluminum fan backboard

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Rim and Net: Rim shall be #39 extra-heavy-duty rim with #34 super nylon net

or approved equal. As available from NorCal Supply (925)984-2075,

- P. Pool Area Fence: Shall be 8ft Wireworks Anti-Climb Fence or equal as available from Ameristar Premium Security 888-333-3422. Color shall be black.
- Q. Pool Area Gate: Shall be 8ft Wireworks Anti-Climb Gate or equal as available from Ameristar Premium Security 888-333-3422. Color shall be black. Gates shall have the following accessories as noted in the Drawings:
 - 1. ADA compliant Lever handle (Schlage Rhodes Model or Equal)
 - 2. ADA compliant Panic Bar (Von Duprin 99 Series or equal)
 - 3. Self closing box hinges (Welded)
 - 4. Kick plates (14 Ga)
- R. Play Area Fence: Shall be per plans.
- S. Removable Bollard: Shall be per plans

PART 3 - EXECUTION

- 3.1 LAYOUT: Prior to commencing installation, Contractor shall stake layout and request a review by the Owner's Representative to determine adjustments on site from locations shown on drawings.
- 3.2 INSTALLATION:
 - A. All site accessories shall be installed per manufacturer's specifications.

END OF SECTION 32 33 00

**SPECIAL PROVISIONS
MCKINLEY PARK RENOVATION**

SECTION 32 84 00

PLANTING IRRIGATION

PART 1 - GENERAL

1.1 SCOPE

- A. Work in this section includes renovation to the park's automatic irrigation system, including modifications to the irrigation controller, trenching, piping, equipment, electrical components and incidentals related thereto.

1.2 QUALITY CONTROL

- A. Standards: Unless otherwise shown or specified, all materials and methods shall conform to section 20-2 of the State of California Department of Transportation Standard Specifications (DTSS) as they reasonably apply to this work except for measurement and payment requirements.
- B. All irrigation shall be provided and performed in accordance with the current City of Stockton Standard Specifications and Details. Wherever these plans and the City Standards conflict, the higher quality standard or specification will apply.
- C. Reviews: Contractor shall specifically request the following reviews prior to progressing with the work:
 - 1. Layout of system.
 - 2. Points-of-connection excavation.
 - 3. Trenching and pipe assembly.
 - 4. Coverage adjustment of all heads and valve box installation.
 - 5. Operation of system.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Quality: All materials shall be new and the best quality available unless otherwise specified. All materials shall be clearly marked by manufacturer on all material, containers, or certificates of contents for inspection.
- B. Irrigation Equipment: Refer to drawings. Any desired substitutions require submittals in duplicate for specific written approval.

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- C. Plastic Pipe and Fittings: All mainline pipe ¾" – 1-½" in size shall be polyvinyl chloride (PVC) Schedule 40; sizes 2" - 3" shall be Class 315 Bell and Gasket PVC. Pipe 4" and larger shall be Class 200 PVC Bell and Gasket PVC conforming to ASTM D 2241. Unless otherwise noted, all laterals shall be Class 200 PVC pipe; solvent weld fittings, if used, shall be Schedule 40, or Schedule 80 as called for on details. Solvent for piping shall be as recommended by manufacturer. All pipe shall be clearly labeled with manufacturer type and specification numbers.
- D. Control Wire: Type UF, 600 v. insulation, minimum size #14, copper, common to be white, valve control wire to be red or black, U.L. approved for irrigation control use; splices shall be "Scotch-Lok" seal pack, or equal.
- E. Valve Boxes: Precast concrete or plastic of type and size indicated; free of all cracks, chips or structural defects. Boxes located in pavement (asphalt or concrete) and/or subject to vehicular traffic shall be concrete and have heavy duty steel covers. Boxes shall be sized to provide a 4" minimum clearance around the irrigation equipment inside the box, excluding all pipes and fittings.
- F. Thread Sealant: Permatex Thread Sealant, part #14H, white in color.
- G. Fittings for bell and gasket pipe to be ductile iron fittings grade 65-45-12 as manufactured in accordance with ASTM A-536. Ductile iron fittings shall be as manufactured by Harco, Lynchburg, Virginia. Saddle for valve manifold connections shall be Double Stainless Steel strap, epoxy coated saddle as manufactured by Romac, model 202N nylon coated, distributed by Ewing (800) 343-9464.
- H. Thrust blocks required at all change in direction, per City Standard Specifications. All fittings shall be wrapped in 76-1.02H plastic prior to installation of thrust block.

PART 3 - EXECUTION

- 3.1 GRADING: Contractor shall be responsible for installing all irrigation features to their finished grade and at depths indicated. All rough grading shall be completed before trenching commences.
- 3.2 LAYOUT AND TRENCHING: All features of the irrigation system shall be staked and pipe alignments marked prior to trenching for review by the City's Representative

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- 3.3 **BACKFILLING:** Do not cover joints until system has been reviewed by the City's Representative. Backfill with damaging rocks and debris shall not be permitted. Compact all backfill and eliminate settlement. Previously prepared soil is to be replaced as the top six inches of backfill.
- 3.4 **FABRICATION:** Snake pipe from side to side when trench exceeds thirty feet in length. All manifolds shall be neat, orderly, and constructed for ease in maintenance operations. Construct manifolds to allow valve boxes to be parallel to each other and to adjacent walls, walks, curbs, and buildings. Cuts and joints shall be free of burrs, smooth, and minimum in quantity. All pipe above finish grade shall be galvanized unless noted otherwise.
- 3.5 **PIPELINES:** All pipelines shown parallel on the drawing may be installed in a common trench. Where pipelines are shown parallel or adjacent to shrub or groundcover areas, they shall be installed in these areas. All changes in depth of pipe shall be accomplished using 45-degree fittings.
- 3.6 **TESTING:** Test mainline at 125 psi for six (6) hours. Test and repair as necessary until satisfactory test conditions are obtained.
- 3.7 **CONTROL WIRE:** Install control wire in pipe trenches wherever practical. Tape to underside of pipe every ten feet. Loop wire every 20 feet. Splices shall occur in valve boxes only and shall be accomplished utilizing approved connectors. All wire shall be installed below or level with the bottom of adjacent pipes. All wiring above finish grade shall be enclosed in steel conduit. Splices shall be installed in junction boxes.
- 3.8 **ADJUSTMENTS:** Adjust all heads for arc, radius, riser height, and distribution for uniform and optimum coverage. Such adjustments shall include nozzle changes without additional cost to *City*.
- 3.9 **FINISH GRADE:** Unless otherwise noted, all heads shall be set at finish grade and on double or triple swing joints as called for on drawings. The top of all valve boxes shall be flush with finish grade.
- 3.10 **CONTROLLER:** Contractor shall clearly label and sequence stations for ease in maintenance operations. Station valves to operate as they are located around the site. Fasten controller and wire conduits securely. Contractor shall complete all forms and labels shipped with and/or attached to the controller; attach his own name, address and phone number to the controller via a permanent label; and shall properly execute and file with the City the controller and valve guarantees. Contractor shall provide the City with a color coded irrigation station chart on laminated 11x17 sheets (2 copies).

Prior to final acceptance, the Contractor shall program the controller for a 5-day watering schedule with a watering window of 10pm through 6am. No day-time watering should be scheduled for Saturdays and Sundays. Irrigation schedule

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shall be as shown in the plans and designed to keep pump at 80-95% of design capacity.

- 3.11 IRRIGATION SYSTEM AUDIT: Contractor shall coordinate the services of a 3rd part Certified Irrigation Auditor and provide assistance to the auditor to complete the irrigation audit. The Contractor shall schedule the audits once the irrigation system is in operation. Provide a two week (14 day) notice for scheduling the audit.
- 3.12 RECORD DRAWING: Contractor shall regularly update a print of the system and any changes made to the system throughout the project. Features below ground shall be indicated with at least two measurements from surface features such as walks, building, or sprinkler heads. All changes shall be recorded on this plan before trenches are backfilled. The record drawing shall be completed and submitted to *City* before final payment shall be made for work installed.

END OF SECTION 32 84 00

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**SECTION 32 91 13
LANDSCAPE SOIL PREPARATION**

PART 1 - GENERAL

1.1 SCOPE

- A. Furnish and install all landscape soil preparation as shown and specified, including, but not necessarily limited to, the following: soil testing, stockpiling of native soil, topsoil placement, organic amendment, fertilizer, and finish grading.

1.2 QUALITY CONTROL

- A. Reviews: Contractor shall specifically request at least two working days in advance of the following reviews prior to progressing with the work:
 - 1. Completion of rough grading
 - 2. Verification of amendment incorporation depths
 - 3. Finish grade
- B. Certification: Written certificates stating quantity, type, and composition, weight and origin for all amendments and chemicals shall be delivered to the Owner's/City's/County's Representative before the material is used on the site.
- C. Soil Testing: Contractor shall provide soil samples to Waypoint Analytical, Inc. of Anaheim, (714) 282-8777 for testing in accordance with these specifications. Test results shall be made available to the City's Representative. Contractor shall allow sufficient time for testing prior to preparing soil for planting.
 - 1. The following soils tests are required under these specifications:
 - a) Import Topsoil: Prior to construction, Contractor shall submit import soil for horticultural soil analysis, Sample shall be a representative composite taken from each source and delivery of import topsoil.
 - b) Pre-Plant: Following amendment and fine grading and prior to installation of plant material, contractor shall submit for horticultural soil analysis: one quart-sized sample of in-place topsoil. Sample shall be a representative composite taken from several planting areas.

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2. Testing costs for initial samples and costs for any additional samples due to non-compliance shall be paid for by the Contractor.
 3. No material shall be delivered to the site until the *City's* Representative approves the material.
 4. Contractor shall allow for sufficient time for testing prior to construction.
- D. Amendment Samples: Contractor shall provide an analysis of the amendment from a Seal of Testing Assurance (STA) Certified Compost Lab, designated by the US Composting Council (USCC). Or, send a one-gallon sample of each proposed amendment to Soil Control Lab of Watsonville (831)724-5422, for their testing for conformance to this specification.
1. No material shall be delivered to the site until the *City's* Representative approves the samples.
 2. Testing costs shall be paid for by the Contractor.
 3. If an alternate laboratory is used, the laboratory must be STA certified by the USCC, using test methods described in the "Test Methods of the Examination of Composting and Compost" (TMECC) test methods manual.
- E. Biotreatment Soil Mix Submittals: The Contractor shall submit to the Engineer for approval:
1. A one-gallon size sample of biotreatment soil.
 2. Certification from the soil supplier or an accredited laboratory that the biotreatment soil mix meets the requirements of this specification.
 3. Grain size analysis results of the fine sand component performed in accordance with ASTM D 422, Standard Test Method for Particle Size Analysis of Soils or Caltrans Test Method (CTM) C202.
 4. Quality analysis results for compost performed in accordance with Seal of Testing Assurance (STA) Standards.
 5. Organic content test results of biotreatment soil mix. Organic content test shall be performed in accordance with Testing Methods for the Examination of Compost and Composting (TMECC) 05.07A, "Loss-On-Ignition Organic Matter Method.

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6. Grain size analysis results of compost component performed in accordance with ASTM D 422, Standard Test Method for Particle Size Analysis of Soils.
 7. A description of the equipment and methods used to mix the sand and compost to produce biotreatment soil mix.
 8. Provide the name of the testing laboratory(s) and the following information:
 - a) Contact person(s)
 - b) Address(es)
 - c) Phone contacts(s)
 - d) E-mail address(es)
 - e) Qualifications of laboratory(s) and personnel including date of current certification by U.S. Composting Council (USCC), ASTM, Caltrans or approved equal.
- F. Planting Areas: All areas to be planted, whether in seed, sod, container stock, flats, or otherwise, are defined as planting areas in these documents.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Native Topsoil: Shall be the existing surface layer of soil on site. This layer typically will be a different color and texture than the subsoil, and may be of varying thicknesses. The Contractor shall be responsible for reviewing the area limits and depths of native topsoil on site with the City's Representative.
- B. Import Topsoil: Shall be a homogeneous mineral soil classified as loam, sandy clay loam, or sandy loam with clay content between 15 and 25%. The sum of silt plus clay shall be less than 35%. Import topsoil shall not contain more silt and clay than the on-site native soil.
 1. Particle size data shall be based upon standard USDA methodology. Of the material falling in the sand category, a minimum of 50% shall fall in the fine sand range .05 - 5mm. Gravel content greater than 2.0mm shall be less than 15%.
 2. Soil chemistry shall be suitable for growing the plants specified; the soil shall be non-saline as determined on the saturation extract. Salinity shall not exceed 3.0 mmhos/cm, boron shall not exceed 1.0 ppm and the sodium absorption ratio (SAR) shall not exceed 6.0.

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Soil reaction as determined on a saturated paste shall fall between 5.5 and 7.5.

3. The soil shall be free of organic herbicides, or other growth-restricting chemicals. Contamination may be tested by greenhouse trials using rye grass and radish as test crops using the proposed import soil as substrate. These trials require four to five weeks for completion.
- C. Topdressing Soil (for Turf Maintenance Treatment): Organic matter content should be in the range of 5-8% by weight. Gravel 2 - 12 mm less than 5% total weight of soil. On a weight basis the particles passing a 2 mm sieve should comply with the following: Coarse sand 0.5 - 2.0 mm less than 15%, silt 20-30%, and clay 10-25%. The soil shall be non-saline as determined on the saturation extract. Salinity shall not exceed 3.0 mmhos/cm, boron shall not exceed 1.0 ppm and the sodium absorption ratio (SAR) shall not exceed 6.0. Soil reaction as determined on a saturated paste shall fall between 5.5 and 7.5. The soil shall be free of organic herbicides, or other growth restricting chemicals.
- D. Fertilizers (for native topsoil) : Shall be
1. Ammonium Sulfate (21-0-0)
 2. Triple Superphosphate (0-45-0)
 3. Potassium Sulfate (0-0-50)
- E. Fertilizers (for import topsoil) : Shall be based on result and recommendations based on soil testing.
- F. Organic Amendment:
1. Compost: Shall be Z-Best's Organic Compost available through Z-Best Composting (408) 846-1574 shall conform to:
 - a) Seal of Testing Assurance Program from the US Composting Council.
 - b) Compost parameters, below:

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Property	Test Method	Unit of Measurement	Requirement
pH	TMECC 04.11-A Elastomeric pH 1:5 slurry method pH	units	6–8.5
Soluble salts	TMECC 04.10-A Electrical conductivity 1:5 slurry method	dS/m (mmhos/cm)	0– 10
Moisture content	TMECC 03.09-A Total solids & moisture at 70 ± 5 °C	% wet weight basis	30-60
Organic matter Content	TMECC 05.07-A Loss-on-ignition organic matter method (LOI)	% dry weight basis	30–60
Maturity	TMECC 05.05-A Germination and vigor	% relative to positive control	Seed emergence 80 or above Seedling vigor 80 or above
Stability	TMECC 05.08-B Carbon dioxide evolution rate	mg CO ₂ -C/g OM per day	4 or below
Pathogen	TMECC 07.01-B Salmonella < 3 MPN per 4 grams, dry weight basis	Pass/ Fail	Pass
Pathogen	TMECC 07.01-B Fecal coliform bacteria < 1,000 MPN per gram, dry weight basis	Pass/ Fail	Pass
Physical contaminants	TMECC 02.02-C Man-made inert removal and classification: Plastic, glass, and metal % > 4 mm fraction	% dry weight basis	combined total: < 0.5%
Physical contaminants	TMECC 02.02-C Man-made inert removal and classification: Sharps (sewing needles, straight pins and hypodermic needles) % > 4mm fraction	% dry weight basis	none detected
Particle size fine for compost used as soil amendment	TMECC 02.02-B Sample sieving for aggregate Size classification	% dry weight basis	Pass 2"-inch sieve 98% min Pass 3/8-inch sieve 95% min
Heavy metals	PASS / FAIL	mg/kg (ppm), dry weight basis	All EPA 503 metal contaminant limits
Carbon:Nitrogen Ratio		Carbon : Nitrogen	≤25:1

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Note: TMECC refers to "Test Methods for the Examination of Composting and Compost," published by the United States Department of Agriculture and the United States Compost Council (USCC). (Table modified from the US Composting Council Landscape Architectural Specifications 2005.)

- G. Bio-Retention Planting Media: Shall meet the following criteria:
1. General Requirements: Biotreatment Soil Mix shall achieve a long-term, in-place infiltration rate of at least 5 inches per hour. Biotreatment Soil Mix shall also support vigorous plant growth.
 - a) Biotreatment Soil Mix shall be a mixture of fine sand and compost, measured on a volume basis:
 - 60%-65% Loamy Sand
 - 35%-40% Compost
 2. Sand for Biotreatment Soil Mix
 - a) General: Sand shall be free of wood, waste, coating such as clay, stone dust, carbonate, etc., or any other deleterious material. All aggregate passing the No. 200 sieve size shall be non-plastic.
 - b) Sand for Biotreatment Soil Mix Texture: Sand for Biotreatment Soil Mix shall be analyzed by an accredited lab using #200, #100, #40 or #50, #30, #16, #8, #4, and 3/8 inch sieves (ASTM D 422, CTM 202 or as approved by municipality), and meet the following gradation:

<u>Sieve Size</u>	<u>Percent Passing (by weight)</u>	
	<i>Min</i>	<i>Max</i>
3/8 inch	100	100
No. 4	90	100
No. 8	70	100
No. 16	40	95
No. 30	15	70
No. 40 or No. 50	5	55
No. 100	0	15
No. 200	0	5

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Note: All sands complying with ASTM C33 for fine aggregate comply with the above gradation requirements.

3. Compost for Biotreatment Soil Mix: Compost shall conform to the Seal of Testing Assurance Program from the US Composting Council and to the parameters below:
- a) Organic Matter Content: 35%-75% by dry wt.
 - b) Carbon and Nitrogen Ratio: C:N<25:1 and C:N>15:1
 - c) Maturity/Stability: Any one of the following is required to indicate stability:
 - 1) Oxygen Test < 1.3 O₂/unit TS/hr
 - 2) Specific Oxy. Test < 1.5 O₂/unit BVS
 - 3) Respiration Test < 8 C/unit VS/day
 - 4) Dewar Test < 20 Temp. rise (°C) e.
 - 5) Solvita® > 5 Index value
 - d) Toxicity: Any one of the following measures is sufficient to indicate non-toxicity.
 - 1) NH₄⁺ : NO₃-N < 3
 - 2) Ammonium < 500 ppm, dry basis
 - 3) Seed Germination > 80% of control
 - 4) Plant Trials > 80% of control
 - 5) Solvita® > 5 Index value
 - e) Nutrient Content: Provide analysis detailing nutrient content including N-P-K, Ca, Na, Mg, S, and B.
 - 1) Total Nitrogen content 0.9% or above preferred.
 - 2) Boron: Total shall be < 80 ppm
 - f) Salinity: Must be reported; <6.0 mmhos/cm
 - g) PH shall be between 6.2 and 8.2 May vary with plant species.
 - h) Compost Quality Analysis by Compost Supplier: Before delivery of the compost to the soil supplier the Compost Supplier shall verify the following:
 - 1) Weed seed/pathogen destruction: provide proof of process to further reduce pathogens (PFRP). For

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example, turned windrows must reach min. 55C for 15 days with at least 5 turnings during that period.

4. Compost for Biotreatment Soil Mix Texture: Compost for Biotreatment Soil Mix shall be analyzed by an accredited lab using #200, ¼ inch, ½ inch, and 1 inch sieves (ASTM D 422 or as approved by City), and meet the following gradation:

<u>Sieve Size</u>	<u>Percent Passing (by weight)</u>	
	<i>Min</i>	<i>Max</i>
1 inch	99	100
½ inch	90	100
¼ inch	40	90
No. 200	2	10

- a) Bulk Density: Shall be between 500 and 1,100 dry lbs/cubic yard.
- b) Moisture Content: Shall be between 30%-55% of dry solids.
- c) Inerts: Compost shall be relatively free of inert ingredients, including glass, plastic, and paper, < 1% by weight or volume.
- d) Select Pathogens: Salmonella < 3 MPN/4 grams of TS, or Coliform Bacteria < 10,000 MPN/gram.
- e) Trace Contaminants Metals (Lead, Mercury, etc.) Products: Must meet US EPA, 40 CFR 503 regulations.

PART 3 - EXECUTION

3.1 LIMITS AND GRADES

- A. Grade Review: Prior to commencing soil preparation operations, Contractor shall request a review by the Owner's/City's/County's Representative to verify specified limits and grades of work completed to date and soil preparation work to commence. Contractor shall complete the rough grading as necessary to round the top and toe of all slopes, providing naturalized contouring to integrate newly graded areas with the natural topography. Finish grading under this section shall be completed in accordance with the grades indicated on the drawings.

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- B. Grading at Existing Trees: Soil work within the dripline of existing trees shall be performed in accordance with tree protection requirements indicated on the plans and section 32 1 91, Tree Protection and Pruning.

3.2 STRIPPING AND STOCKPILING OF EXISTING TOPSOIL

- A. Excavation Areas: The native topsoil shall be stripped and stockpiled on-site in sufficient quantities to provide a six-inch layer throughout all planting areas. Topsoil to be stripped and stockpiled shall be taken from the surface layer after all organic litter and foreign debris has been removed and properly disposed.
- B. Existing Grade Unchanged: In those areas where grades are not proposed to be modified (areas of no excavation or fill) the native topsoil shall be left in place. All debris, as well as all rocks over 0.75 inches in diameter, shall be removed from the surface of planting areas.

3.3 TOPSOIL PLACEMENT

- A. Depths indicated in this section are for bidding purposes. Depth of scarification, height of soil lifts and depths of incorporation shall be as recommended by the soil testing lab.
- B. Soil Moisture: If soils are saturated, suspend soil work operations until the soil moisture drains to below field capacity.
- C. Subgrade preparation: Excavate planting areas to the proposed subgrade and remove all construction debris and materials.
 - 1. Do not over excavate compacted subgrades of adjacent pavement or structures.
 - 2. Subgrades shall slope approximately parallel to the finished grade and/or toward the subsurface drain lines as shown on the drawings.
 - 3. Scarify or rip to a depth of seven inches and protect from compaction.
- D. Topsoil Incorporation: Uniformly distribute a three-inch layer of topsoil and incorporate into the top six inches of subsoil by ripping, scraping, or tilling to mix the subsoil with the topsoil into a homogeneous mixture. Repeat until the total depth of topsoil placed is as indicated on the drawings. The final layer of topsoil shall be uniformly distributed in the planting areas and compacted in place to 85% compaction
- E. Existing Topsoil to Remain: Except within tree protection zones, in those planting areas where native topsoil is to be left in place, cross rip to a depth of ten inches. Then incorporate the amendments to a homogeneously blended soil depth of six inches.

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3.4 BIO-RETENTION PLANTING MEDIA MIX PLACEMENT

- A. Do not excavate, place soils, or amend soils during wet or saturated conditions.
- B. Operate equipment adjacent to (not in) the Biotreatment soil mix facility. If machinery must operate in the facility, use lightweight, low ground-contact pressure equipment.
- C. Place soil in 12" lifts with machinery adjacent to the facility. If working within the facility, to avoid over-compacting, place first lifts at far end from entrance and place backwards toward entrance.
- D. Allow Bio-retention planting media mix lifts to settle naturally, boot pack (walk around to firm) lifts to achieve 85% compaction effort. After all lifts are placed, wait a few days to check for settlement and add additional media as needed.
- E. Verify Bio-retention planting media mix elevations before applying mulch or installing plants.

3.5 ORGANIC AMENDMENT AND FERTILIZER INCORPORATION

- A. Organic amendment: After topsoil placement and compaction, spread organic amendment at a rate of 4 cubic yards per 1000 square feet*, unless otherwise specified by the soils report.
- B. Fertilizer: Spread uniformly on top of compost at rates determined by soil tests. For bidding, assume per 1000 square feet:

7 pounds Ammonium Sulfate (21-0-0)

5 pounds* Triple Superphosphate (0-45-0) for all planting areas except soccer field turf receiving Turf Maintenance Treatment per plans.

or

10 pounds* Triple Superphosphate (0-45-0) at soccer field turf receiving Turf Maintenance Treatment per plans.

and

6 pounds* Potassium Sulfate (0-0-50) at soccer field turf receiving Turf Maintenance Treatment per plans.

* The rate of Triple Superphosphate or Potassium Sulfate may change based on the analytics of the approved organic amendment. The rate

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specified above is based on 270 lbs. of dry weight organic matter per cubic yard of amendment.

- C. Incorporate organic amendment and fertilizer into the top 6 inches of topsoil, until homogeneously blended.

3.6 PLANT PITS

- A. Plant Pit Preparation: Plant pits shall have their sides and bottoms loosened or otherwise broken to prevent glazed or compacted surfaces, and shall be as shown on the planting detail.

3.7 BACKFILL

- A. Backfill Material and Placement: Only unamended soil shall be used beneath the root ball; cultivate bottom of plant pit to improve porosity. Backfill around sides of rootball shall be the amended soil taken from adjacent prepared areas. Spread material excavated from plant pits onto adjacent areas as replacement.
- B. The top 12 inches of backfill around the sides of the rootball of trees and shrubs may consist of the amended soils described in paragraph 3.5 above or may be prepared as follows:

4 parts	Site Soil
1 part	Organic Amendment*

Uniformly blended with:

1/3 pound*	Ammonium Sulfate (21-0-0)
1/4 pound*	Triple Superphosphate (0-45-0)

* The rate of Triple Superphosphate or Potassium Sulfate may change based on the analytics of the approved organic amendment. The rate specified above is based on 270 lbs. of dry weight organic matter per cubic yard of amendment.

3.8 PLANT PACKETS

- A. Packet Quantities: All container plants shall receive plant packets as follows:

one-gallon plants	one 10-gram packets
five-gallon plants	two 10-gram packets
fifteen-gallon plants	nine 10-gram packets

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24 inch box trees

sixteen 10-gram packets

Space the packets evenly around the root ball in backfill, 6-8 inches from soil surface, 1 inch away from root ball. City's/ Representative may require excavation of up to 5% of all plants selected at random for conformance review.

3.9 FINISH GRADING

- A. Grading Operations: Contractor shall finish grade all irrigated planting areas unless otherwise noted, and shall remove all rocks and clods over one cubic inch to a depth of one inch below finish grade. All areas shall be smooth and uniformly graded. All erosion damage during the construction period shall be repaired by the Contractor.
- B. Finish Grades: Unless otherwise noted, all soil finish grades shall be one inch below finish grade of walks, pavements, and curbs.

END OF SECTION 32 91 13

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SECTION 32 93 00

PLANTING

PART 1 - GENERAL

1.1 SCOPE

- A. Furnish and install all turf from sod, container plantings, groundcover, root barrier, mulch, headerboard, staking, and related work thereto.

1.2 REFERENCES

- A. Interpretations of plant names and descriptions shall reference the following documents. Where the names or plant descriptions disagree between the several documents, the most current document shall prevail.
 - 1. USDA – The Germplasm Resources Information Network (GRIN) <http://www.ars-grin.gov/npgs/searchgrin.html>
 - 2. Manual of Woody Landscape Plants; Michael Dirr; Stipes Publishing, Champaign, Illinois; most current edition.
 - 3. New Sunset Western Garden Book, Oxmoor House, most current edition.
- B. ANSI American Standard for Nursery Stock
- C. Federal, State, and County laws requiring inspection for plant disease and insect control.

1.3 QUALITY CONTROL

- A. Reviews: The Contractor shall specifically request the following reviews prior to progressing with the work:
 - 1. Plant material approval
 - 2. Plant layout
 - 3. Finish grade
 - 4. Substantial completion
 - 5. Final completion

1.4 SUBMITTALS

- A. Plant Material: Within *thirty (30)* days after award of contract, Contractor shall submit notice to the *City's* Representative certifying the quantity and species of plant material ordered, the nursery supplying the material, any

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plant material unavailable at the time, and proposed plant substitutions. No plants shall be ordered or delivered prior to written acceptance by the City's Representative.

- B. Mulch: Name of supplier and one quart-sized sample.
- C. Certificates: All plant materials shall meet the specifications of Federal, State, and County laws requiring inspection for plant diseases and insect infestations. Inspection certificates required by law shall accompany each shipment, invoice, or order of stock, and when such plants arrive at the site of work, the certificate of inspection shall be filed with the City's Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Nomenclature and Labels: Plant botanical names shall conform to current literature noted in section 1.2. All plants of each clone, species, and cultivar shall be delivered to the site labeled with their full botanical names. Every plant species shall be labeled with no less than one label for every ten plants of a species.
- B. Quality: Minimum quality of all plant material shall conform to prevailing published specifications of the California Association of Nurserymen and the American Association of Nurserymen's American Standard for Nursery Stock unless otherwise indicated. Additional specifications shall be indicated on the drawings.
- C. Quantities: The quantities shown on the plant list and in labels are for the City's Representative's use and are not to be construed as the complete and accurate limits of the contract. Contractor shall furnish and install all plants shown schematically on the drawings. Any unlabeled plants shall be considered as the smaller size shown for that type on the drawings.
- D. Root Systems: All container-grown stock shall be grown in its container for at least six months prior to its planting. Contractor shall allow one percent of the quantity of plants for removal and inspection. Any plant material, within one year following the final acceptance of the project, determined by the City's Representative to be defective, restricted, declining or otherwise deficient due to abnormal root growth, shall be replaced by Contractor to the equal condition of adjacent plants at the time of replacement.
- E. Trees: All trees shall have straight trunks of uniform taper, larger at the bottom. Trunks shall be free of girdling roots or damaged bark, with all minor abrasions and cuts showing healing tissue. Sucker basal growth

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and sucker lateral growth shall be removed and treated to eliminate re-sprouting. Normal lower side branching shall remain. Trees unable to stand upright without support shall be rejected.

- F. Health: Foliage, roots and stems of all plants shall be of vigorous health and normal habit of growth for its species. All plants shall be free of all diseases, insect stages, burns, or disfiguring characteristics.
- G. Untrue Species: All plant material, within two years following the final acceptance of the project, determined by the *City's* Representative to be untrue to the species, clone, and/or variety specified, shall be replaced by the Contractor, to the equal condition of adjacent plants at the time of replacement.
- H. Sod: Shall be minimum 95% purity and 85% germination. Inert matter shall not exceed 2.0% nor weed content 0.00%, with no noxious weeds. Sod type shall be as indicated on the drawings. Sod shall have a well-developed root structure sufficiently mature so that it will hold together when held by one end of the roll. Yellowing, brown, diseased, dried, or pest infested sod shall be rejected. Soil thickness of the sod shall be 1/4 inch to 5/8 inch thick excluding top-growth and thatch; top-growth shall be uniformly mowed to 1-1/2 inch to 2 inches for bluegrasses and ryegrasses with excess clippings and surface debris removed; size of rolls or slabs shall be consistent to the suppliers standard length and width and is not to vary by more than 2% in either dimension. Sod composition shall be per plans.
- I. Turf Seed (for overseeding as part of Turf Maintenance Treatment): Shall be minimum 95% purity and 85% germination. Inert matter shall not exceed 5.0% nor weed content 0.22%, with no noxious weeds, of commercial quality and certified by the California Crop Improvement Association. Seed shall be pre-mixed and packaged by a commercial seed supplier, tagged and labeled in accordance with California Agricultural code. All seed shall be pretreated with "Thiram", or a similar pre-emergent fungus preventative, and shall be species indigenous to the area and suited to the properties of the site. Seed shall be certified composed of the following:

90%	Tall fescue
10%	Kentucky bluegrass

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- J. Bark Mulch (Mulch):
 - 1. Except as otherwise noted below, mulch shall be walk-on bark, free of disease, invasive weeds and seeds. Available Redi-Gro (800)654-4358. Maximum 3” grind.
 - 2. Mulch in bioretention areas shall be Z-Best Organic Mulch, (408)846-1577 or equal.
- K. Root Barrier: shall be per plans.

PART 3 - EXECUTION

3.1 GENERAL

- A. Plant Material Approvals: Before planting operations commence, all or a representative sampling of plant material shall be reviewed at the site by the City’s Representative. Defective plants installed without such review shall be removed from the site upon request by the City’s Representative and an acceptable plant substituted in its place.
- B. Storage and Handling:
 - 1. Plant materials shall be protected and maintained in good condition. Bare root and balled materials shall be watered regularly and placed in a cool area. Plant material shall be protected at all times from animal damage, vandalism, drought damage, wind damage, frost damage, toxic irrigation water, or any other condition that would damage or reduce the viability of the plants. Plants shall be kept moist at all times and shall be completely watered twelve (12) hours or less before planting and shall be moist when installed.
- C. Layout: Only those plants to be planted in any single day shall be laid out. Locations of all plants shall be reviewed prior to planting. Plants installed without this review shall be transplanted as directed by the City’s Representative.
- D. Protection of Plants: Contractor shall maintain all plant material in a healthy growing condition prior to and during planting operations. Contractor shall be responsible for vandalism, theft and damage to plant material until the commencement of the maintenance period.
- E. Root Systems: Contractor shall be responsible for inspection of all root systems on plant materials. Inspection shall include, but not be limited to, checking for rootbound stock, encircling roots at the perimeter of the container, evidence of girdling roots, and other defective root conditions. Such inspections shall include the complete removal of soil from one percent of plant material containers, or at least one plant from each

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nursery and each plant type. Contractor shall cut defective or potentially defective girdling, rootbound, and encircling roots and spread the root system into the surrounding backfill. Plants with excessively defective root systems shall be rejected by the Contractor.

- F. Pruning: Contractor shall do no pruning without the specific approval of the City's Representative. Plants pruned without approval shall be replaced by the Contractor, if required.
- G. Basins: Construct basins as necessary to water plants. Remove basins from all plants under a permanent irrigation system prior to final inspection and finish grade the planting area. Basins for plants to be hand-watered shall remain in place. Basin bottoms shall drain to berm away from plant stem.
- H. Staking: All trees shall be staked as drawn with stakes driven securely into existing soil aligned with the trunk and perpendicular to the direction of the prevailing winds. A minimum of two figure-eight rubber tree ties required per stake.
- I. Plant Pits, Backfill and Finish Grading: See Soil Preparation Section 31 92 13 for materials and installation requirements.
 - 1. Sod Installation: Finish grade to smooth even surface allowing for sod thickness at pavement and other structures to leave the sod one-half inch below the finish grade of adjacent structures. The soil surface shall be sufficiently firm to resist impressions over one-quarter inch deep, and shall be lightly rolled until meeting this firmness. The top six to eight inches of soil shall be watered until this zone has an optimum moisture content for root growth.
 - 2. Sod shall be laid in rows with staggered ends neatly and tightly butted on all edges. Sod shall be protected from wind and sun exposure during storage with a maximum storage period of twenty-four hours. No overlap, gaps, ripples, or other uneven pavement will be accepted. Contractor shall lightly roll all sod after installation to insure optimum contact with the soil. Trimming and cutting around structures shall be completed with sharp tools and carefully fitted so the final appearance is a solid continuous turf.
- J. Cleanup: After completion of all operations, Contractor shall remove all trash, excess soil and other debris. All walks and pavement shall be swept and washed clean, leaving the entire area in a neat, orderly condition.

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END OF SECTION 32 93 00

**SPECIAL PROVISIONS
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SECTION 33 42 00

STORMWATER CONVEYANCE

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

- A. Furnish all labor, materials, equipment and incidentals required to provide storm water piping, catch basins and related site storm drainage facilities in accordance with the Contract Documents.

1.2 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

- B. Commercial Standards

- 1. ASTM International (ASTM)

ASTM A48	Gray Iron Castings
ASTM A126	Gray Iron Castings for Valves, Flanges, and Pipe Fittings
ASTM A193	Specification for Alloy-Steel and Stainless Steel Bolting Materials for High Temperature or High Pressure Service and Other Special Purpose Applications
ASTM A194	Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
ASTM A276	Stainless Steel Bars and Shapes
ASTM A615	Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM B21	Naval Brass Rod, Bar, and Shapes
ASTM B187	Copper, Bus Bar, Rod, and Shapes and General Purpose Rod, Bar, and Shapes
ASTM C387	Packaged, Dry, Combined Materials for Concrete and High Strength Mortar
ASTM C1173	Flexible Transition Couplings for Underground Piping Systems

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ASTM C1460	Shielded Transition Couplings for Use with Dissimilar DWV Pipe and Fittings above Ground
ASTM D1785	Poly Vinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120
ASTM D2321	Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D3212	Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM D3350	Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
ASTM F477	Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

1.3 SUBMITTALS

- A. Submit, under provisions of Division 01, product data and certificates of compliance for all materials proposed to be used under this Section.
- B. Survey and as-building data in accordance with Paragraphs 3.1 and 3.10 in this Section.
- C. Product data for all pipe, manhole, catch basin, frames, covers, grates, pipe flexible connectors, lining and joint materials. Product data shall include installation instructions and installation tolerances.
- D. Documentation for all precast reinforced concrete manholes indicating compliance with ASTM C478, Section 5.
- E. Inspection and testing documentation for information within 14 days of inspection and/or test.

PART 2 -- PRODUCTS

2.1 GENERAL

- A. Extent of Work: Pipe, fittings, and appurtenances shall be provided in accordance with the requirements of applicable sections of Divisions 2 and 15 of the Standard Specifications and as indicated.

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2.2 STORM DRAIN PIPE

- A. Storm drain pipe shall be provided as indicated on the Drawings in accordance with the requirements herein and applicable section of Section 71 – Sanitary Sewers and Storm Drain Sewers.
- B. Fasteners: All bolts, nuts, and washers shall be of Type 316 stainless steel, Class 2, conforming to ASTM A193 for bolts and ASTM A194 for nuts, unless otherwise indicated or specified.
- C. Polyvinyl Chloride Pipe
 - 1. Polyvinyl chloride pipe (PVC) shall be type PSM SDR-35 PVC, ASTM 3034 for sizes 4” through 15”, and type PS 45 PVC, ASTM F679 for sizes 18” through 24”.
 - 2. PVC pipe and fittings shall be marked per ASTM standard requirements.
 - 3. Joints:
 - a. Joints shall be integral wall bell and spigot configuration, factory formed in accordance with ASTM D3212. All rubber rings shall conform to ASTM F-477.
 - b. Reducing wyes for service laterals shall be in line bell and spigot type, factory moulded.
 - c. Solvent welded saddle fittings for lateral connection may be used upon approval by Engineer;
 - d. Maintenance hole connections using PVC pipe shall be by rubber ring water stop installed on piping and cast in center of maintenance hole wall or four inches from outside face of maintenance hole base. Pipe section on water stop at maintenance hole shall have bell flush with outside of maintenance hole.

2.3 PRECAST CONCRETE MANHOLES

- A. Precast reinforced concrete manhole sections including manhole riser sections, flat slab top section, transitions, and a base section shall be provided in accordance with Caltrans Specifications Section 90-4 – Precast Concrete.

2.4 CATCH BASINS

- A. Concrete: Concrete for catch basins shall be in accordance with Section 71 – Sanitary Sewers and Storm Sewers.
- B. Forms: Form the vertical surfaces and provide fillets on re-entrant angles. Form material for exposed surfaces shall be plywood and others shall be steel, matched boards, plywood, or other material acceptable to the Engineer. Trench walls, large rock or earth will not be acceptable form material.

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- C. Reinforcing Steel: Reinforcing steel shall conform to ASTM A615, Grade 60, deformed bars.
- D. Precast Units: Precast units may be substituted for cast-in-place unit, subject to approval by the Engineer. Precast units shall conform to ASTM C478, except that dimensions shall be as shown. Concrete risers for extensions shall be a maximum of 6 inches high and of same quality as sections. Extensions shall be watertight. Submit details of proposed precast units, including shop drawings and design calculations prepared by a registered civil engineer in the State of California, to the Engineer for review.
- E. Mortar: Standard pre-mixed mortar conforming to ASTM C387, Type S or proportion one-part Portland cement and 2-part sand by volume. Sand shall be clean, silica-based natural sand or a combination of natural and manufactured sand, free from clay or organic material conforming to the following grading requirements. Manufactured sand shall be the product obtained by crushing stone or gravel specially processed to assure suitable particle shape and gradation. When tested in accordance with ASTM D2419, the sand equivalency shall not be less than 35. Mortar shall be mixed to a consistency suitable for the intended purpose.

Sieve Size	Percentage Passing Sieve
No. 4	100
No. 8	95 - 100
No. 16	70 - 95
No. 30	35 - 75
No. 50	5 - 35
No. 100	0 - 10
No. 2	0 - 5

- F. Frames, Gratings and Covers: Cast iron frames, gratings and covers and for catch basin and storm drain inlets shall be as indicated and designed for AASHTO HS 20-44 loading. Bearing surfaces shall be clean and shall provide uniform contact. Castings shall be tough, close-grained grey iron, sound, smooth, and clean in conformance with ASTM A48, Class 30, free from blisters, blowholes, shrinkage, cold shuts and defects.

2.5 TRENCH DRAINS

- A. Trench Drain channel may be monolithic polymer concrete or high density polyethylene. End caps must be provided by the line drain manufacturer. Trench Drain sections must not have side extensions. The interior surface of the line drain channel must be smooth below the level of the frame, grate, and associated connections.
Trench Drain sections must be either non-sloped uniform depth sections from 4-7/16 to 12 inches or pre-sloped sections with a minimum continuous 0.6 percent slope with graduated depths from 4-7/16 to 12 inches.

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- B. Trench Drain frames and grates must be ductile iron. Frames and grates include bolts, nuts, frame anchors, connector cover and other connecting hardware must be stainless steel. Steel frame must be stainless steel.
Frames and grates must comply with AASHTO M306 and be classified heavy duty traffic rated with a transverse proof-load strength of 25,000 pounds.
Frames and grates must be anchored into the body of the line drain or concrete backfill.
Steel anchoring rods and shear studs, if used, must comply with ASTM A1044.
Except for grates installed within designated pedestrian paths of travel, grate design must accept inflow of runoff through openings consisting of a minimum of 60 percent of the total top surface area of the grate. Individual openings or slots must have a dimension not greater than 2 inches measured in the direction of the grated line drain flow line.
Grates installed within designated pedestrian paths of travel must be certified as conforming to the provisions of the ADA.

2.6 FLEXIBLE CONNECTORS

- A. Unless indicated otherwise, joints between pipes and manhole sections, catch basins, or other concrete structures shall be provided with resilient flexible connectors in accordance with the following requirements.
1. The connector shall provide a positive watertight connection for pipes entering precast manholes or other flat-wall concrete structures.
 2. The connector shall be capable of withstanding at least 10 psi of hydrostatic pressure and sustaining an axial deflection of at least 7.0 degrees in any direction in accordance with the test methods and requirements in ASTM C923, Section 7.
 3. All rubber gaskets shall be manufactured from a synthetic elastomer and shall contain no less than 50 percent by volume of first-grade synthetic rubber and comply with the physical requirements prescribed by ASTM C923.
 4. All metal hardware shall be Type 316 stainless steel conforming to Section 4.2 – Mechanical Devices of ASTM C923.
- B. Flexible Boot Connectors: Flexible boot connectors shall be watertight resilient type connectors in accordance with ASTM C923 to establish a watertight joint between the manhole wall and pipe. The seal between the connector and the pipe may be made by mechanical means or by compression of the resilient material against the outside of the pipe. Flexible boot connectors shall be capable of withstanding minimum 15 degrees of omnidirectional deflection and ½-inch of centerline offset while maintaining a watertight connection. The boot connectors shall be provided with all necessary fasteners, pipe clamps, and expansion bands to create a watertight seal.

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- C. Waterstop Bands: Waterstop bands shall consist of a resilient rubber waterstop band conforming to Section 4.1.1 of ASTM C923 and Type 316 stainless steel bands combined with mortaring around annular space with non-shrink grout to establish a watertight pipe-to-manhole connection. Waterstop bands shall be designed for use with new or existing round or flat wall structures to seal cold joint pipe penetrations.

2.7 NON-PRESSURE FLEXIBLE COUPLINGS

- A. Elastomeric Sleeve Couplings: Flexible transition couplings for joining underground non-pressure piping of same or different pipe sizes or materials shall be elastomeric, sleeve-type, reducing or transition coupling, in compliance with ASTM C1173, including ends of same sizes as piping to be joined, and Type 316 stainless steel tension band and tightening mechanism on each end. Molded-in bushings shall be provided for material transition and size reduction as required.
 - 1. Shielded Flexible Couplings: ASTM C1460, elastomeric or rubber sleeve with a full-length, Type 316 stainless-steel outer shield ring of 0.012-inch thick minimum, and a Type 316 stainless-steel tension band and tightening mechanism on each end. The shear ring shall be designed and manufactured to fit the elastomeric or rubber sleeve.
 - 2. Unshielded Flexible Couplings: Elastomeric sleeve with Type 316 stainless-steel shear ring and corrosion-resistant metal tension band and tightening mechanism on each end.
 - 3. Provide shielded flexible couplings non-pressure, gravity flow underground installations, unless otherwise indicated.
 - 4. Provide shielded flexible couplings non-pressure, gravity flow above ground installations, unless otherwise indicated.

2.8 UNDERGROUND UTILITY MARKING TAPE

- A. Marking of underground utility lines shall be provided in accordance with Section 33 90 00 – Utility Line Marking.

2.9 MANUFACTURERS OR EQUAL.

- A. Steel Reinforced Polyethylene Ribbed Pipe, manufacturer or approved equal
 - 1. Contech, DuroMaxx
- B. Flexible Boot Connectors
 - 1. Trelleborg Pipe Seals Milford, Inc., NPC Kor-N-Seal
 - 2. A-Lok Products, Inc., G3 Boot System
- C. Waterstop Bands

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1. Trelleborg Pipe Seals Milford, Inc., NPC-Waterstop Grouting Ring
2. A-Lok Products, Inc., Water-Stop Connectors
- D. Flexible Transition Couplings, manufacturer or equal
 1. Fernco Inc.
 2. **Mission Rubber Company LLC**
 3. NDS Inc.

PART 3 -- EXECUTION

3.1 PREPARATION

- A. Any pipe that has been broken, cracked, or otherwise damaged before or after delivery or that has failed to meet required tests shall be removed from the work site and shall not be used therein.
- B. Verification of Existing Tie-In Points:
 1. All existing piping inverts identified to be field verified in the Contract Documents shall be surveyed to verified invert elevation and manhole/diversion box location prior to starting any excavations.
 2. Notify the construction manager of all survey information in conflict with information indicated in the Contract Document and shall not proceed with work until all conflicts have been resolved.

3.2 INSTALLATION/APPLICATION/ERECTION

- A. All excavation and backfill for the site storm drain system shall be in accordance with Section 19 – Trench Excavation and Backfill.
- B. Installation of steel reinforced polyethylene ribbed pipe shall be in accordance with ASTM D2321 and pipe manufacturer's published instructions for piping installation.
- C. No defective pipe shall be laid in trench. Trench bottoms found to be unsuitable for foundations after pipe laying operations have started shall be corrected and brought to exact line and grade with approved bedding materials.
- D. Install piping beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's recommendations for use of lubricants, cements, and other installation requirements.
- E. Pipe slope shall not be less than ¼-inch per foot or 2 percent unless pipe inverts are indicated. Where invert elevations are indicated, install pipe at a uniform slope between inverts.

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- F. Gravity-flow-systems piping shall be installed at constant slope between points and elevations indicated. Straight piping runs shall be installed at constant slope, no less than that specified.
- G. Each joint shall be laid so that it will form a close concentric joint with adjoining pipe in order to avoid sudden offsets or inequalities in flow line. Any pipe that is not true alignment or that shows any settlement after being laid shall be taken up and re-laid.
- H. Join pipes and fittings as recommended by the manufacturer.
- I. Resilient connectors shall be installed where indicated so as form a neat pipe -to-manhole connection and to prevent leakage and infiltration.
- J. Water shall not be allowed to run or stand in trench while pipe laying is in progress, before the joints are completely set, or before trench has been backfilled. Divert stream flow and dewater each section as work progresses where sewer pipelines are located in or across stream beds or drainage ditches.
- K. Interior of pipe shall be kept thoroughly clean as work progresses. All earth, thrash, rags, and other foreign matter shall be removed from interior after each length of pipe has been laid.
- L. Before backfilling, ensure that pipe lies evenly on bottom of trench, that no debris is present, and that as-built surveying is complete.
- M. Backfilling of trenches shall be started immediately after the pipe in place has been approved by the inspector.
- N. Repair any damage to the pipe exterior or coating prior to backfilling.

3.3 PIPE JOINT CONSTRUCTION AND INSTALLATION

- A. Pipe and Fittings: Install in accordance with the pipe manufacturer's written instructions.
- B. Flexible Connectors: Manhole-to-pipe flexible connectors shall be installed in accordance with the Manufacturer's written instructions.
- C. Pipe Flexible Joint: Where the installation of flexible connectors is not indicated, the pipe spool connecting to the manholes, catch basins, or other concrete structures shall be of adequate length to provide a flexible pipe joint no more than 1½ feet from the exterior surface of the manhole walls.
- D. Proper sized increasers, reducers, fittings and couplings shall be provided where joining of different sizes or materials of pipes is required.

3.4 UTILITY LINE MARKING

- A. Marking of underground utility lines shall be provided in accordance with Section 33 90 00 – Utility Line Marking.

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3.5 INSTALLATION OF UNDERGROUND UTILITY MARKING TAPE IN PIPE TRENCH

- A. Detectable metallic locating tape shall be laid along the centerline of the pipe trench at a depth of 18 inches below finished grade in accordance with Section 33 90 00 – Utility Line Marking.

3.6 CONNECTIONS TO EXISTING UNDERGROUND MANHOLES AND STRUCTURES

- A. Provide division facilities and perform work necessary to maintain flow during connection.
- B. Connections to underground manholes and structures shall be made by cutting or core-drilling into existing unit and creating an opening large enough to allow 2 inches of non-shrink grout to be packed around entering connection or to allow installation of flexible boot connectors to provide water-tight seal.
 - 1. End of connection pipe passing through pipe or structure wall shall be cut to conform to shape of and be flush with inside wall unless otherwise indicated.
 - 2. On outside of pipe, manhole, or structure wall, entering connection shall be encased in 6 inches of concrete for minimum length of 12 inches to provide additional support of collar from connection to undisturbed ground. The grouting of the annular space and the concrete encasement will not be required for the installation with flexible boot connectors.
 - 3. Epoxy-bonding compound shall be applied as interface between new and existing concrete and piping materials.
- C. Existing manholes and structures shall be protected to prevent concrete or debris from entering while making tap connections. Debris or other extraneous material that may accumulate shall be removed.
- D. Seal pipe in manhole with flexible connectors or waterstop.
- E. Re-grout to provide smooth flow into and through manholes.
- F. Steel reinforced polyethylene ribbed pipe connections to concrete structure: Pipe shall be connected to manholes or vaults by grouting in place with a non-shrink grout in accordance with Section 03 60 00 - Grouting such that the ribbing section will provide a mechanical lock between the pipe and the grout used to seal the pipe opening in the concrete manhole. A gasket or butyl strip material, as recommended by the manufacturer, shall be used to fill the valley of the ribs at the open end of the pipe to provide a water tight connection. Other means may be used to provide a seal as approved by the Engineer.

3.7 CONNECTIONS TO EXISTING PIPING

- A. Pipe couplings, expansion joints, and deflection fittings with pressure ratings at least equal to piping rating shall be used unless otherwise indicated.

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- B. Non-pressure type flexible couplings shall be used to join gravity-flow, non-pressure storm drain and sewer piping unless otherwise indicated. Flexible transition couplings shall be used to joint pipes of different materials and/or sizes.
- C. Existing piping shall be protected to prevent debris from entering while making tap connections. Debris or other extraneous material that may accumulate shall be removed.

3.8 DRAINAGE APPURTENANCES

- A. Manholes, catch basins, junction chambers, box culverts, outlet chambers and other drainage structures: Construct as indicated on Drawings.
- B. Ensure that Post Construction Best Management Practices (BMP) have a visible identifying manufacturer tag with product identification, manufacturer contact information, date of last service and date of next service due.
- C. Provide storm drain stencil per County requirements, as applicable.

3.9 TRENCH DRAINS

- A. Trench drains must be installed in trenches excavated to the lines and grades established by the Engineer. Grade and prepare the bottom of the trench to provide a firm and uniform bearing throughout the entire length of the grated line drain.
- B. Installation of trench drains and joints must comply with the manufacturer's instructions.
- C. Install trench drains with sections closely jointed and secured such that no separation of the trench drains occur during backfilling.
- D. The frame or grate must not extend above the level of the surrounding concrete backfill.
- E. Outlet trench drains into new or existing adjoining area landscape drainage facilities as shown.
- F. Outlets must be covered with an elevation matching fill of drainage rocks up to the level of the concrete area. Avoid abrupt drop-offs from the edge of concrete and the landscape area.
- G. Place concrete backfill in the trench as shown. Place against undisturbed material at the sides and bottom of the trench in a manner that prevents (1) floating or shifting of the trench drain and (2) voids or segregation in the concrete.
- H. Immediately remove foreign material that falls into the trench before or during concrete placement. Prevent material from entering the grated line drain during construction.

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- I. Secure frame and grate or trench drain wall to the surrounding concrete backfill with steel anchoring rods as shown. Alternative securing methods must provide a minimum pullout resistance of 685 lb/ft of length of grated line drain frame.
- J. Concrete backfill must be finished flush with the adjacent surfacing.
- K. Remove all forming material from the cast-in-place drain channel without gouging or marring the surface. Patch spalls, holes or rock pockets with mortar with a cement to sand ratio of 1 to 3 by volume.

3.10 FIELD QUALITY CONTROL

- A. Perform survey and prepare as-builts of the installed storm drain system and as-builts shall include the following:
 - 1. Location and elevation of all new storm drain system manholes and diversion boxes.
 - 2. Location and elevation of all existing storm drain system manholes and diversion boxes which have been modified by the Contract Documents.
 - 3. Invert elevations of all new inlet and outlet piping at each manhole and diversion box.
- B. Perform the following inspections and correct all defects resulting from defective materials and/or workmanship.
 - 1. After installation but prior to backfilling and generate a report to document the results.
 - a. Inspect for broken or cracked pipe and fittings.
 - b. Visually inspect pipe joints for displacement or improper fit of the gasket material. Follow pipe and gasket manufacturer's recommendations for rejection due to non-watertightness of the joint.
 - c. Inspect for damage to the pipe coating system.
 - 2. During and after the placement of backfill and generate a report to document the results.
 - a. Inspect interior piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of the Work.
 - 3. Defects requiring correction shall include, but not limited to, the following:
 - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
 - b. Crushed, broken, cracked, or otherwise damaged piping.
- C. Testing:

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1. Unless otherwise indicated, watertightness tests on storm drain piping shall be performed in accordance with Section 71 – Sanitary Sewers and Storm Sewers.
 2. Any piping determined to be leaking shall be repaired or replaced and the pipe section re-tested.
- D. Protection: Protect the Work of this section until Substantial Completion.

END OF SECTION 33 42 00

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SECTION 33 90 00

UTILITY LINE MARKING

PART 1 - GENERAL

1.01 WORK OF THIS SECTION

- A. Furnish and install utility line marking, complete in place, in accordance with the Contract Documents.
- B. Color-coded surface marks (paint or a similar coating) shall be provided to indicate the locations and route of buried utility lines, not comprised at least in part of magnetic components.

1.02 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.
- B. Commercial Standards
 - 1. American National Standards Institute (ANSI)
ANSI Z535.1 American National Standard for Safety Colors
 - 2. American Wood-Preservers' Association (AWPA)
AWPA U1 Use Category System: User Specification for Treated Wood

1.03 SUBMITTALS

- A. Submit, under provisions of Division 01, product data and certificates of compliance for all materials proposed to be used under this Section.
- B. Shop Drawings
 - 1. Manufacturer's technical data, product specifications, installation instructions and general recommendations.
 - 2. Certification stating that the materials used in the tape fabrication meet the requirements of this section.

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- C. Samples: Samples of proposed components, 24-inch strips of tape and two markers.

PART 2 - PRODUCTS

2.01 PIPE LOCATING WIRE

- A. Provide pipe locating wire for:
 - 1. All site non-gravity utility pipes buried beneath the ground outside of the building pad
- B. Pipe Locating Wire (Buried Pressure Utilities): Insulated AWG No. 10, soft drawn, single-strand copper wire.
- C. Provide at least six mil PVC electrical tape insulation around wire where adjacent to metal pipe, valves, and in all valve boxes.

2.02 MARKING TAPE

- A. Unless indicated otherwise, detectable underground utility marking tape for accurately locating the underground utility installations shall be placed above all buried pipelines, which are not comprised at least in part of magnetic components. The tape shall be color-coded clear polyethylene film having an aluminum backing to make underground assets easy to find using a non-ferrous locator.
- B. Detectable marking tape shall consist of metallic foil laminated between two layers of impervious plastic film having a minimum overall thickness of 5 mils (0.005 inch) ± 10 percent manufacturing tolerances. The width of the detectable tape shall be 6 inches, unless otherwise indicated.
- C. The tape shall be constructed of a 0.8 mil clear polyethylene film reverse printed with designated color-coding and a repeating warning message of the utility line, laminated to a 0.35 mil aluminum foil with a 3.75 mils clear polyethylene film backing, capable of being inductively detected electronically. Adhesive shall be compatible with foil and film.
- D. The tape shall have a minimum breaking tensile strength of 35 lb./in. and minimum elongation of 80 percent at break in accordance with ASTM D882 and be capable of enduring service temperatures from -60 °F to 250 °F.
- E. Unless indicated otherwise, the tape shall be color coded meeting the American Public Works Association (APWA) designation and the supplemental requirements herein and labeled with legend or other

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applicable marking approved by the City. The tape shall be permanently printed; surface printing will not be acceptable.

1. Imprint: 1-inch or larger bold black letters
2. Legend
 - a. Identify buried utility line tape with imprint, "CAUTION – BURIED UTILITY LINE BELOW".
 - b. Repeat identification at approximately 24-inch intervals.
3. Background Color: APWA uniform color codes using the ANSI Z535.1 safety colors and as specified below:

ANSI Safety Color	Utility
Safety Red (Pantone 1795)	Electric power lines, cables, conduit and lighting cables
Safety Yellow (Pantone 108)	Gas, oil, steam, petroleum or gaseous materials
Safety Orange (Pantone 144)	Communication, alarm or signal lines, cables or conduit
Safety Blue (Pantone 2945)	Potable water
Safety Green (Pantone 3415)	Sewers, storm drains, and drain lines
Safety Purple (Pantone 253)	Reclaimed water, irrigation and slurry lines
Safety Brown (Pantone 168)	Chemical lines

F. Manufacturer, or equal

1. Presco
2. Reef Industries, Inc.
3. Brady Corporation

2.03 SURFACE MARKERS

- A. All markers shall have an identifying letter either cast or routed into marker.
- B. Providing any of the following types of markers.

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1. Cast-in-place Concrete: Compressive strength of 3,000 psi at 28 days; maximum size aggregate, 1-inch; air entrainment, 6 percent, plus or minus 1½ percent. One No. 3 steel reinforcing bar in center of the marker.
2. Precast Concrete: Commercially fabricated concrete marker meeting design dimensions and concrete reinforcing requirements.
3. Timber Posts: Any softwood lumber species meeting PS 20-70. Grade No. 1 or better, free of heart center, S4S, size as shown. Pressure treat timber posts for soil contact with waterborne preservative in accordance with AWPA U1.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Locating Wire

1. Pipe locating wire must be provided for the entire length of all pressure pipelines except for metallic piping.
2. Install locating wire by strapping to the pipe or tubing with PVC tape, polyethylene backed tape, or tie locks. Test pipe locating wire with pipe locator equipment prior to final acceptance of pipeline.
3. Stub the locating wire up inside each valve box. Sufficient excess length must be provided at terminal connections to allow continuation of locating wire to the terminal connection.
4. Wire splices must be made with compression fittings or soldering; wrapped with Tac-Tape, Aqua-Seal; and wrapped with electrical tape. Prevent bare copper wire from contacting metallic appurtenances including, but not limited to, pipe, buried valves, or fittings.

B. Marking tape

1. Install tape in backfill directly over each buried utility line as shown. Place tape by plowing or during final backfilling.
2. Where utilities are buried in a common trench, identify each line by a separate warning tape. Bury tapes side by side directly over the applicable line.

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3.02 ELECTRICAL CABLE AND CONDUIT SURFACE MARKERS

- A. In addition to marking tape, install surface markers at all changes in horizontal direction or at intervals not exceeding 400 feet.

END OF SECTION 33 90 00

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APPENDIX A

**GEOTECHNICAL ENGINEERING REPORT
MCKINLEY PARK RENOVATION
BY GEOCON CONSULTANTS, INC.
DATED, MAY 2021**

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APPENDIX B

**ASBESTOS AND LEAD-CONTAINING PAINT SURVEY REPORT
MCKINLEY PARK
BY GEOCON CONSULTANTS, INC.
DATED, JUNE 9, 2021**

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APPENDIX C

**MCKINLEY PARK SOILS NUTRITIONAL ANALYSIS
BY WAYPOINT ANALYTICAL
DATED, MARCH 17, 2022**

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APPENDIX D

**PG&E MCKINLEY PARK GAS SERVICE INSTALLATION GAS SERVICE
RECORD (GSR), APPLICANT INSTRUCTIONS, & APPLICANT
MATERIALS LIST
BY PACIFIC GAS & ELECTRIC
DATED, OCTOBER 7, 2022**

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APPENDIX E

CITY OF STOCKTON SURVEY MONUMENT PRESERVATION FORMS